advanced alternatives to IBM3270 and ICL7502

for details contact PT7 Sales 061-437 5391

Simonsway, Manchester M22 5LA **FERRANTI**

NEWS IN BRIEF Potter sues **US** govt

LEGAL action is being taken by peripheral manufacturer Potter against the US government over the latter's use of tape drives that employ the 6,250 bpl Group Code R Recording technique patented by Potter in the early sixties. Under the US patent laws a compnny can, as an alternative to suing the manufucturer, take action against a user of equipment that employs its patent but has not been licensed. However, the US government indemnifies itself in its contracts against having to pay roynlties, so if Potter wins its action they will probably have to be pald to Potter by the unlicensed suppliers.

HP launch

AN Impact matrix line printer with a speed of 400 lines per minute has been announced by Hewlett-Pnckard. The HP 2606A can produce both conventional characters or graphics under microprocessor control, and has a starting price of £5,600.

Employment study

THE Federal German Ministry of Research and Tachnology is to spend 1.3 DM million (£350,000) in a bid to anawer the question "To what extent will rapidly advancing technology affect employment prospects in industry?" It has commissioned a study that will be conducted jointly by Mackintosh Consultants, and Prognos of Basle.

Regent savings

BY revising its marketing arrangements for the Regent VDU range, Diglco ls now oble to offer a full option version, with a complete range of editing for £1,050. This represents a saving of £300.

Latest: New ICL

now available

and insurance, retailing and a host of c

from Metra Lowndes-Ajax.

General Ledger Package

Already over three hundred organisations worldwide are enjoying tramendous benefit from the General Ledge Pockage supplied by

In the United Kingdom elonosome lorty compenies prolit from its

uso. They come from Italda as diverse as manufecturing, banking

Find out more by clipping the coupon below or phoning Welr Larsen on 01-680 2400 now.

Now evaliable in its latest form for ICL 1900 installations

Metra Lowndes-Ajax, 17 Lanadowne Rd., Croydon CRO 2BX. Tel: 01-680 2400

Metra

Lowndes-Ajax

An international systems

perinership between Metra Consulting Group and Lowndes-Ajax Computer Sorvice

Aiding rehabilitation of drug addicts

THE first company to donate a fixed sum towards individual treatment of a drug admontha, and so far Narconon claims an 63 limits an 63 limits role in contributing to his new life. dict under a special rehabilitation pro- per cent success rate.

gromme is IBM. The programme, which requires the addict to follow a carefully controlled diet and sponsorship scheme under which companies lifestyle under 24-hour supervision, is run by such as IBM can donate £155 townrds the arconon, a worldwide drug rehabilitation opening phases of implementation of the group founded in Arizona State Prison in reliabilitation programme. IBM's contribution played an important part in helping quantities of minerals and vitamins to combat the painful effects of drug withdrawal re-adjust to a normal lifestyle, after seven symptoms, coupled with a regime of relaxing physical exercises and study prelods to re-establish the ex-addict's concen-

Supported entirely by charitable donn-tions, Narconon lias only just set up the David Rowe, a 26-year-old ex-alcoholic to years of drug addiction, during which he was

unoble to hold down a job. Today Rowc leads a normal life, after overcoming severe physical and mental

The commercial sponsorship scheme proposed by the Caterham, Surrey hused offices of Narconnn, first came to the attention of one of IBM's employees at its Croydon branch. He recommended that the fixed sum of £155 be dunnted, and Rowe was immediately allocated residential treatment along with the eight other addicts currently undergoing the rehabilitation programme.

A spokeswoman for Narconon said that the group was constantly in need of financlal support and the precedent set by IBM would, hopefully, be followed by other interested enumanies

IBM 64K RAM 'more than just a memory'

From a apecial US correspondent.

ENDING speculation about its activities surrounding the introduction of ita own high capacity memory chips in the new 8100 and System 38 machines, IBM last week revealed that its 64K RAM, aithough bigger and slower than its rivals, is more than just a memory. About 30% of the IBM chip is taken up with performance optimising functions not normally found in a memory chip, according to T. M. Liptak, president of IBM's general technical division.

Talking in Burlington, Vermont, last week. Liptak said the 64K RAM is the king of a new formily of IBM memory devices that also includes a 32K and an 18K part. Both the size and performance of this device have been the subject of consid-

erable speculation. Liptak quoted the typical access tima of the 64K RAM as baing 300 nanoseconds, while tha chip area is around 62,000 square mils. The access time is more than twice that quoted by Texas Instruments for its own 64K RAM, and the size is about

double the TI part. But the extra functions in the IBM chip includa, for example, an 6-bit register that la capable of a 100 nanosecond data rate, bl-directional input/output bus-sing and the oblity to occess data while tha memory is being refrashed. The chip also con-

tains 2,500 bits of redundant This is only brought into play when functional testing of the chip reveals the addresses of defective bits. When located, the 'redundunt" meniory section is programmed as a raad only-

write once memory, holding data on the defective bit addresses, so that only the good bits become chip addressable. Though the access time nppears slow. IBM states that these added functions give an niproved duta rate. The chips are mounted on melol/ceromic carrier modules

net by next year of the Greeter Mancheoter County Fire Ser-vice control complex in Swinton, the Forrentl produced Computer-based Mobilioing System being used here will nid the 41 stations in the area to be mure afficient in deploying men and equipment to fireo.

control

Besad on Ferrentl's Argue 700G systsm, it will be rasponsible for monitoring 500

Menchooter County Fire Sta-IFC (CW, March 18, 1996) A SIMPLE input station for tha for buying annther whole sys-

quero miles and a population of

Interest has been generated

mong other fire aroas and i

was demonstrated to over 100

Domonotroting the oyelum in the photograph ere leading fire central operator Liz Online (left)

end fire control operator Enid

Devies, both from the Greeter

firo bilgedeo lact walek at For-mnti'o Cheadle Honth site.

simoot three milli

At the same time IBM has nonounced price reductions on its existing System 6 models. These reductions range from £3,167 on the 6/430 disc-plus-cards unit to

£1,598 on the 6/452. The 6/420 will sall for £6,653 or to be prepared for printing on a rent for £247 a month for a 12seporate unit without the need month lease.

Merger 'not in interests of ITT'

Input station for Office

System 6 word processor

FUTURE restructuring of the erested in a marger of STC, our UK telecommunications industry will definitely not
include a mergar of STC and
Plessey, according to ITT's haad
office in New York & company

which are joined together in

groups of ten to form 11.4 x 17.8

cm memory cards holding 256K bytes of RAM.

Offica System 6 word processor

has baen announced by IBM

for the benefit of users with

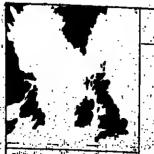
large volumea of keyboard-

sists of a kayboard, screen and

floppy diac drive. It allows discs

Designated the 6/420, it con-

offica in New York. A company statement sald, "ITT is not interests of ITT shareholders."



Admic Computer Leading Ltd 27 Chancery Lane, London WC2, Teb 01-405 8238, Tetor 285344

ATLANTIC

AVAILABLE EX-STOCK

370/145.102 — fully featured 370/135.100 — tully feetured 370/148. KOD — hasic machine

- please call us for low-cost flaxible leasing terms.



30-32 Neal Street, London WC2H 7PS Telephone 01-836 4663, Telex 298452

Printed in Great Britain by Q.B. Limited and Colcharter, COS 31.1, and published by P. Seerres. Colcharter, COS 31.1, and published by P. London St. Press Lui. Dorset House, Stamford Street, London St.



Number 627

Thursday, November 16, 1978

Price 18p

Visual Display Terminals

NEWBURY

PRICES FROM £495

Newbury Loboratories Ltd. Heed Office & Sales King Street, Odihom Hampshire RG25 1NN Tel 025-871 2910 Telex. B58815

Privacy proposals 'compromise to please nobody' YW may take Protection Committee, as described so far in unofficial reports (see page 5) appear to be Nixdorf stake 'n compromise to please nobody," according to Ted Cluff.

SEEKING capital to enable the company to maintain its rapid growth rate and better exploit international markets, Nixdort PLANS for decentraling. Computer is discussing an incomputing control to the jection of nuncy from West level within the internal control to the international are under the latter is substantial minnrity sion. Operations are noware; puter manufacturer.

Increased market effort for tiolly concentrated that new Nixderf products like the Heoth in the Company 8811 data telephone and 8815 word proressor would result from such a deal.

to migrate to 2900 (Serge). Prime targets

Processing Ltd cente at sent equipped with the System 4/72s, CDP into

and has chosen law

querotional contrologies

installation but leave pa

development to staff &

Legal publisher Buts

Wants an entirely &

operation with its out

ment staff, and is the

terms of o Digitals."

he on the 2900s, he had a mini. Prima, Oil Vit

Dalu General and Her

Orlhoms Press already h

Own development stall, but

all its applications es

Teamco bureau, set up

Norweglan company bit

Packard are all conten

Press, whose mate white

wards Heath.

already have their owner. COMPUTER systems in government departments, particularly dependent with an invite tax, sorial services and immiand a Prime 300 minute gration departments, could be IPC Magszines has a line orime targets if civil servonts and plans for a secolar decide to take industrial action in their corrent pay negotiations, which have been held up pending a much delayed report from the independent Pay Research Unit. Interview with the deputy general secretary of the Society of Civil and Public Servants - page 14.

MP attacks ICL

LABOUR MP Bob Hughes has been tated that the Attorney Genthas no evidence that there are grounds for investigating ICL's connection with Rhodesin But Hughes, who is chairman of the Anti-Apartheid Movement. has been asked to provide lutther evidence to support a clum he made in Parliament last week that an advertisement offering services for ICL equipment in South Africa should lend to a scrutiny of ICL operations in southern Africa.

'Probe secret service'—Benn

THE secret service should have its compulsr-based files subject to public occount oblity scorting to the Hema Polloy Combiles of the Lebour Porty, which is chaired by Energy Minister Tony Senn. The computer wants an inquiry into the amistar Tony Benn. The com-latte wants an inquiry into the lable accountability of the burity services to avoid the arrivenant of an information bite that is part of en "oppo-line which is not under demo-

Timers stop

BUFFICIENT order rates are reason given by Data too for Archion to stop selling its OEM coduct. Here of 600 and 900 plers. The company will contact to huid low spaed printers it say with the systems it sells found users and will carry on the stop with the first partiage discussions it is to the OEM market.

minese pay-off the years of Intensive effort in

thing have begun to pay off fdr-letti with a contract (or an pecified number and type of ininals. Olivatti is also diaaing technology transfer and pussibility of setting up nufacturing plants in China.

there are other indications that the committee recommends control of all data handled automatically Cluff suggests that the com-

secretary-general of the In-stitute of Data Processing He niso casts some doubt on

should be controlled. This is iuadequate, Cluff says, and claims

mittee has "dodged a number of the issues" by recommending the correctness of the reports on that a regulatory agency set up the DPC proposals, which say codes of practice instend of

banks lald down by statute. Thus it is unclear, Cluff says, whether citizens will have a right to see and correct information held on them, as they already have under the Consumer Credit Act.

produce the light state of the

Hugh Pitcher of the Notional Computing Centre, on the other hand, was broadly in agreement with the "pragmatic" approach insensitive to details, he sald.

tems such as those connected os with police or security syswith national security. What tenis. was wanted was public accouninhility, he said, not direct public

the hands of a Data Protection knowledge that It exists, what Authority. The law can be too type it is, and who has access to He criticised, however, the could be given in situations notion of blanket exemption where the actual information on from registration for some sys- a system could not be released,

> 🖶 Alon 8enjamin on privacy, page 22.

Deadlines put

Royal touch in Mexico

THE Dake of Kent (centre), Lord Chelfont (right) and Sue Hickmett (left) study terminals attached to a System Ten computer on the ICL stand et the British Industrial Exhibition, which hee been teking place oil this week in Mexico City. ICL SA, 51% owned by Moxicon Interests, was the only computer company exhibiting at this, the lergest exposition staged by the Bridsh Oversees Trade Board in

The Duke is vice-president of the SOTB, Lord Chatfont to pre-aldent of the exhibition, and Sue Hickmett is publicity manager for ICL's international division.

The show was opened by Pre-ident Lopaz Portillo of Moxico, of his term of office gearing up

his compry's aconomy to capits oll which have just been discov

ICL hopes to win a substantia shere of the computer business, and as part of the recent mission to Mexico, formolly ennounced its intention of selling lerge-scole 2900s in Maxico (CW, Sep-

ICL 8A was formed following the ecquisition and restructur of Singer's Mexican subsidis which sold System Ten enri 1500 in the Central American republic for several years. On the atsact was a System Ten demonstrating the SAFES production controlled STARS occurring pock

on IBM orders

THE attractiveness of IBM's two latest releases, the 8100 distributed processing system : the System 38 "small" database husiness machine, has led the company to impose deadlines as a means of "rationing" deliveries. And, despite these two sales successes, more major sales-boosting announcements are expected soon from IBM, including up to four more 8100 models, quantity discounts on the Series 1 minicomputer, a new System 36 between the 34 and 38, and a lower cost version of the 5110 desk top system.

November 30 is the deadline for IBM users in Europe to place urders for the 8100 distributed processing system if they want to stand a rhance of a delivery not too long after the end of

The deadline for System 38 orders was last Friday. November 10, and one of the first UK customers to place an order before then was the Data-Link bureau, which is also planning to set up a System 38 con-

The place of each customer in the delivery queue will be determined by o lottery in the same way that deliveries of the 3031 and 3032 mainframes were ran-

With the 8100, the situation is made somewhat more complex by the fact that IBM hos pro-

"windows" for placing orders. The first "window" closed at the end of October and orders placed before then will get priority over those placed during the second "window." The predictions about IBM's

future aunouncements were made in London last week by Dale Kutnick, consultant with Yankec Group of Cambridge, Massachusetts. Speaking at the Information Studies Ltd conference "Com-

was adamant that the \$100 aunouncement (CW, October 12), was but the tip of a very large

"I know that there are 8150 and \$160 models on the way and

Turn to page 2

LOW profitability by IBM standards backs like the reason for the countary's decision to stop selling the Remote Batch Processing service run at its municating with IBM." Kutnick bureau centre at Wars .ck.

RBP comprises three main applications packages: Prince, Production Requirements and Inventory Control Evoluation: Cnposs, Capacity Planning and Operations Sequencing System;

Turn to pege 15

Computers in schools project

value of computers as an educational resourca, as well as their importance in industry, is one of the main aima of the second phase of the Schools Council project "Computera In the Curriculum", which has just been announced.

The Department of Education ties, teachars associationa, and industrial organisations, aetting

MAKING teachers aware of the out the Department's views on curves and so forth. microelectronics.

The Schools Council project alms to produce taacling moterials in a range of subjects to help teachers use computers in their course work. This second phase, costing £70,000, has been expanded to include mathematics, graphics and his-

part of the contract.

WORKING ABROAD

Analysis of census data is the

main use for computers on the history side of the project. Project staff are co-operating with local authorities to get cansus data going back to the mid-1800s available in machine-raadable

According to the DES' letter, letter sent to education author been excluded because of the the feasibility of a national prolack of cheap high-definition gramme to help schools become graphics terminals for drnwing fully aware of microelectronics.

COMPUTER WEEKLY'S INSIDE NEWS

WINNING THE POOLS

Predicting football results might seem a long woy from oybernetics research. But Professor of Cybernetics at Brunal University. Fronk George, bollaves that the unpredictability of gombling games ogn elucideto certain learning problams. So he has written a program for the pooto which is performing remarks by successfully. Read oit obout it.

Page 4

TIGHT CONTRACTS

Part of the mythology of computing techniques is that it is difficult to predict: development times raises and partornance so it is difficult to put too many appointes into con-

tracts. Tom Gijb, however, believes that the portability or conversion ability of a system should be made ALSO...

Computervis w on Prestol
Focus on Info explosion
Downtime by Chad
Voice storage not Software File Programmer Notes Puzzisr "Hove Cobol, will travel" has always book an attractive inducement for becoming a computer professional, with so much scotte for working around the world. In retitty: however, working outside the UK can heve se many pitfells as loys, as recruitment specialist John Goldsmith explains: Page 12

Op Spot
People and Events
Xerax Alto at Whito House
Micro News
Letters to the Editor
Principles of privacy
Prestal in America

APPOINTMENTS PAGES 23-63

SYSTEMS Computer and Ancillary Equipment UMITED Terminel compressing separate SO km; keyboer 12 C R l' Displaying 16 lines of 64 clear upp SERIES 025 Compact well styled visual di-

play forming leatures separate contections keyboard, anti-glars screen, high delimition? 12 dol upper and fower case character eal. Standard model includes CCITT V24 and aumopro modern inchiges CCI II 've and 20mA interface. S esteciable transmission speeds, 24 lines - 80 characters engle and double line specing, double width characters plus 14 other selectable character highlights, video output port, cursor addressing FROM £580.

. COAIRS 224 High quality page bullered terminal features separate 84-key keyboard including pumpric and control citylere. In a control citylere. léal editing protected formét lebulation, que la mer delinea cherecter, ed le ead keyboerde Communication lacilities include peeudo-synchionous operation

pseudo-synchichous operation. FROM 1755.
Cifel lermines are manufactured in Ins 2 K.
All models ere bovered by & 12 rhoning
warranty shalogaded by a cabable technical
eleport and welfies organisation.

Avro Way, Bowerhill, Melksham Wiltshire SN12 6TP elephone Melksham (0225) 702364 & 704502











Cadbury Schweppes

Vol. 25 Ne. 627

Editor Melcolm Peltu 01-26t 8033

Deputy Editor Tony Higoins 01-261 8896 Advertisement Meneger
Harry Hutson 01-261 8022

Cleas Ad Meneger 9rian Durrent 01-261 8597

IPC Electrical Electronic Press Ltd, Durset House, Stantford Street, London, 621 DLU, Palephone: 21-251 2600, Telegrams/Teles: 251 37 81\$P68 6

Stanch 6 filess: Similingham: 202 Lynton House, Waltell Road, Simingham 278, Telephone C21-356 4838

Menchester: Stellern House Talbot Road Stretford Manchatter M32 Telephone 081-872 421 (

New York: 200 East 42nd Street New Yark, NY 10017 Tel (212) 997 2080 Telex 421710 Published weekly on Thursdey Registered at the Post Office os on newspaper. Puce per copy 18p

Members of Computer Weskly staff may be contacted directly on the extensions listed below. Other departments to Dorset House may be obtained by dolling (01) 281 6000.

EDITORIAL 2S1 8344 2S1 8031 261 8303 261 8025 261 8006 287 8170 261 8036 2S1 6719 281 8042 281 6042 Mike Marples Don Mitchall

081-872 421t

021-368 4838

281 8087 281 8088 281 8098 281 8174 281 8174

081-872 4211

021-358 4838

ADVERTISMS Display Lloyd Collins Stuart Moore Steve Base

Production fan Certer Ken Welford

Emputer Weekly Is sent tree of charge to the following extegories in the UK and Elm only: Company georetales, management services emporatives, this servants responsible for computing, management services especially as a geometric property of the computer company of the compan

Subscriptions for readers outside the shows collegarium Drie geer, UK '£14.5% oversons ER: USA, Canado 832. Students Ff.30; oversons ER: USA, Canado 832. Students Ff.30; oversons ER: USA, Canado 825, Afrancia Tatos on request. Subscriptions: IPC Business Press (Saine & Ulairburion) Lid., Opidiaid House. Perrymount Road, Haywards Rosth, Sesses RH18 3SH. Teb 0444 55143.

Computer Weekly has a circulation

highest fully requested directifies in the UK. The Internetional edition, which is published 10 times syear, has a circulation of over 94,000,

ISSN 0010-478

MIND GAMES

The world's largest range of over 3,000 games and puzzles — a testinating salection in which skill, apritude.

London WY (01-638 8278). Also at 2 Castle Street, Kingston-on-Themes (01-549 8488). Personet shoppers wel-come at both branches or order by post from W1 Cestre.

Why Super Prestel is not exactly magic

world lead in television; but that retrieval. Potentially, however, pioneering work is of little com- it provides all the varied options mercial benefit today. So what to be expected from an adpractical benefit to Britain will vanced computer-based comaccrite from the Post Office's munications service, including current lead in another mass burean-style operations and Information medium, viewdnta? even electronic mail.

At present the Post Office's Having gone through the Prestel viewdata is offered priviewdath learning cycle with marily as a TV-based service for Prestel, the Post Office is currently in a position to assist other telecommunications sup-

DURING the last 18 months or

so, my company has been wor-

king a lot with medical ultra-

sound manufacturers, pro-

ducing combined Polaroid/

CCTV Systems for their dis-

plays. Medical ultrasound sys-

teins work through a hand-held,

body contact transducer boun-

dng sound waves off the Inner

organs through a large number

of microphone/speaker elc-

ments, processing the results

and building up a corresponding

The trouble is that the dis-

plays show the discrete elements

of its composition, so manufa-

cturers are using the delay characteristics of the GDS vidicon

tube CCTV camera to merge

effectively the elements of the

display and make it more of the

The system olso enlorges the

imoge size and add TV-

compatibility for video-taping

Well, that's the background.

Recently, however, a well

us. His display had built-in,

electronic, video scan conver-

sion and output, but still had the

discrete element problem. The

sniulion was effectively to de-

grade the image by viewing the

video monitor through a vidco

camera! As usual, the effect was

good: the elements merged with

no loss of grey scale and the subjective impression was of n more meaningful picture.

However, in the process, the

digital readout from the elec-

tronic calipers pravided as part

of the display, being very small

and at the edge of the picture,

was degraded beyond an

acceptable level. We did

ultimately find a solution to get the beat of both worlds, but the

problem exemplified the com-

monly met syndrome (and this

Solve a bug, create another

You sometimes wonder why

But call it, please, RESEARCH,

It gives much pleasure to the

menaging director of Graphic Dis-play Systems of Cambridge, who wins this week's £5 interrupt price.

COMPUTER WEEKLY

known manufacturer came to

the patient's clinical condition.

mush that the body is.

picture on an oscilloscope.

systems and software. In terms of providing a natlonal public service, Preatel is also probably at least two year's ahead of others.

vices by providing know-how,

However, when we look at the viewdata concept, as opposed to Its short-term implementation requirements, the Prestel lead is

Like television, there is "nothing magical about viewdata." as Prestel's international operations director remarked last the information to be used on mission medium of the future.

potential Is a race against time, a race in which rivals, particularly the French, are placing as many hurdles as possible to hinder the Curporations like GTE and

Perhaps most significantly Prestel does give the UK industry advanced warning that we are on the threshold of the growth of new world markets in Information technology-based products and services, ranging home "terminals" to markets for width techniques - the truns-

know-how spreads, the Post Office will have little to export. So the Prestel export curning

Texas Instruments are also gctting into the viewdata act, while information services companies pliera in setting up similar ser- such as IBM, Xerox and AT&T are committed to deep involvement in the provision of products and services which overlap significantly with Prestel capabilities.

Hawever, the key challenge being faced by the British and other European PTTs, is the development of adequate high bandwidth telecommunications capabilities; and the European

The Prestel buck-slupping should also be tempered by the following twn omens:

PTTs do not have a good record

firstly, a US report (CW. October 12) predicted that there will be a billion-dollar market soon for integrated video/ computer home terminals - and will be dominated by manufacturers like IBM and Texas Instruments, not current

Secondly, although the Japanesc viewdata system Captains might currently be three years behind Prestel, as the Post Office claims, it is designed to be from integrated video/computer must effective with high band-

The Information Explosion

ures and general purpose in-

But these print runs show no sign of abatement. On the con-

trury, as the DP industry widens

its sphere of operations into

such nreas as the electronic

office, the DP presses seem to be

Unfortunately, most DPMs

are niready structured in full-

time mode. Time resources are already fully accounted: het-

ween adjudicating on demarcu-

tion disputes affecting the data

prep and control departments,

sorting out local user problems

or evaluating new equipment,

For the DPM there is no es-

cape from the computer world.

to present a selection of choice

DP jobs. Just in case the

message is missed during the

morning rush hour, the feature

is repeated in the evening.

Fortunately, the DP manager

working in flat-out mode.

a very special meaning for the DP manager, Especially when it Is his desk which is bearing the

DP manngers are in danger of being swamped by the flow of printed information. Given the opportunity, most of those invalved would welcome the chance to join a Timber Prescrvntlon Society.

IPC's Computer Weekly, Data Processing, Systems International and Computer Products Inlernational are nut alone in cloiming space on the DP manager's desk. Overflow contingency plans hove constantly to be revised in order that access can be gained to the office.

Attempting to keep pace with all DP publications, whether weekly, monthly or even yearly, regulres much stamina, time ond space, plus a considerable amount of tolerance. Absorbing all the relevant information colls for memory banks of the exceptional and random kind.

Apart from the trade prass. there are the many individual newsletters and publications Issued by manufacturers, service Industries and professional

Can the ever diligent DPM afford to Ignore the contents of

Can the responsible DP professional Ignore the daily postal input of sales literature, broch-

NOVEMBER 14, 1968

systems or packages, the DPM has to mulatain training plans, manning levels, budgets and strntegy - apart from such matters as work processing und production. What is needed is a dally publication on the lines of Which Project?

Whether nt the breakfost table or Godalming Stotlon, he finds his dally newspaper now regularly features the computing scene. Even the car commuter is not Immune. Computer Weekly the bumph Issued by these com- and one of London's commercial radio stations have linked forces

is not as yet under assault from the book publishing world, as a visit to the recent London Book Fair would hove confirmed. There umong such volumes as Observotions on the goat, How to build your own pdrtable garage, and Secrets of staying allm, only one computer publishar, input Two Nine, was prasent. Perhaps the book ublishing aompanias ara not keen to compete in a market-place covared by the periodical

Next year, Input Two-Nine plans to produce a Who's Who In the DP Industry?

cations continue, the series It is a brave (and perhaps could well be tilled Who has the foolish) manager who consigns time to read what in the DI' all such mailing to the dump industry?

Two UK houses win **EEC** software portability contracts awarded by the EEC in two out that of the projected European whether the incarporation of

Sciences, CERCI of France, and to devise a standard and cost it.

stimulating new husiness activities (CW, November 9).

Announcing the EAL scheme, taking a theoretical maximum which hopes to create a of 55% of the equity, with each

'City does not understand high

technology'-venture capital chief

FAILURE of traditional sources of finance for small technology-based companies has led to the creation

of nonther new scheme nimed at such ventures, this time from Electronic Associates Ltd. Last week,

former merchant banker Dr Stephen Castell annnunced his new company which also aims at

new company taking up to 10%

of EAL's available resources.

The intention is that all the new

companies will be attaining £1

millinn turnovers within five

One reason EAL has the

money available for this exercise

steins from its relationship with

Electronic Associates Inc of

New Jersey, USA, EAL was, un-

til 18 months ago, a wholly owned subsidiary of EAL At that

time it was bought from the US

company by the British direc-

working party to be established

next month by the London

Chamber of Commurce almed at

encouraging large companies to help smaller ones in inner Lon-

A spokesman for Leasco said

European with the exception of

The first phase of the study

would be directed at analysing

A major aspect of the work, he GT 150.

of three areas making up its current project an software por-

tability (CW. August 10). A consortium consisting of that their consortium would be Leasco Software, Christlan examining ten minicomputers in Roysing of Denmark, and total, all of which would be Selenia SpA of Italy has been awarded the study of the com- DEC mon software interface for minicomputers. And the study on conversion the major operating system intools is to be undertaken by a terfaces on each machine. Sub-team drawn from Software sequently, they would attempt

Although convinced the. System 36 was on the wayle. IBM's General Systems Dates he was uncertain what to pect: It could be a compact ipgrade from the System He

In the personal compay market, he said that IBM & determined to be in the bit. it. "They have had a floot orders for the \$12 to \$15,0009 desk-top machine since their are emphasising sale rather, lease, so I expect a little bed

at half the price in late 1999' The 8100, he said, was 122

8100 was by no mean at imous at the conference (sultant David Hebdich :why everyone was so a about it, pointing out a: were many already a. minis with just a capability and more! In this context, he po the need to add additions to expand the number of nunications lines supported

TERMINALS VT100 Video terminal "From £1195 Newbury Lalis' latest range of British VDU High speed, paper tape reader punch. New T-1612 160 c.p.s. bi-directional kayboard printer. Wide range of other Tally princers also available. From £1935 From £860 LA36 DECwriter It LS120 DECwriter III From £1995 ASR DECwriter II Incorporating From £1860 paper-tapa raader punch: Acoustic coupler. LAI80 DECprintar I SYSTEMS LSt.11 Modules ex stock digiltalt PDP II-03 with order processing stock to purchase ledger, sales le

Wilkes Computing Ltd.

COUPLERS MOORE REED & CO. LTD.

A WORLD conference inquiring countries and collective work into the promotion of trade agreements with work councils union organisation in IBM may on conditions of employment in Webb, national officer for with the laws of those coun-

> Webb added that ASTMS has regular contact with the IBM "It is very much an underground group and we contact tham via n post box number and a pseudo-

1903 - have been compiling statistica for the Chinese government aince the mld 1960a, but following a visit by vicepremier Wang Chen to ICL in cantral London this waek, the company is hoping to win some major, new contracts in the

making an intensive tour of UK cluding GEC's Marcon sub-sidiary, as part of China's quest for the technology it needs to modernise under Chairman Hua's new policy (CW; April 13). Managers' dispute for ACAS

micropracessors could be used

tn overcome differences in soft

Christian Rovsing, while Selenla

would be responsible for

Telemechanique and Olivetti

systems in addition to its own

ware architecture.

prohably the 11/70.

FEELING that they are baing treated "like gipsies", ICL mer-keting division managers are taking a dispute on relo expenses to the independent ACAS conciliation service.

Sstwaen 70 and 100 people are involved, and some 50 havo joined ASTMS. Transfaired Leasco would be studying the ICL 2903 and 2904, Ferranti's Argus, and a DEC PDP-11, rom Putney to Bracknell, or acceptable terms, two years ago, they have now been moved Minicomputers from Philips, Siemens, Telefunken, and Nixsgain to Slough. dorf would be examined by

Mertin Roberts, chairmen of the ASTMS group of menegers, taid Computer Weakly that where lest time ICL paid two years' travel costs, it now only offered only six months' os-penses, whi e limited tex-free element. Qualification for relocation a epenses is siec more

ICL said it believed that terms compared fairly with those of other companies, but hoped that erbitration would laed to mutually acceptable solution Talks on the leads have been gaing on eince May.

gives user view of IBM's SNA WITH a requirement to ennble any authorised remote user to to write programs, and one with access systems software availinteractive development facilities for DP professionals." Once able on the central IBM main-

VSPC had been sclected, use of frames, such as the CICS teleprocessing monitor ar IMS the VTAM access method was database, there was no realistic required, which in turn dictated alternative to IBM's Systems Network Architecture. This was the conclusian reached at Cadbury-Schweppes after examining the available options, a conference in London

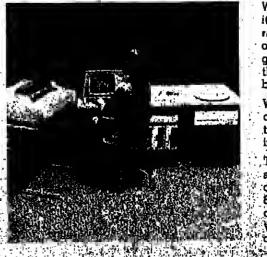
heard last week.

favour of the VSPC timesharing

isms of SNA, notably the Advanced Communication Function, which enables multiple hosts to be accessed in an SNA network. He seea ACF as de-Speaking at the ISL "Comsigned more to confuse the plug-compatible suppliers than municating with IBM" conference (see page I), Mike Berry, to help users, although the mulhead of computing services at Cadbury Schweppes, and that tiple host feature is easentlal to Cadbury Schweppes' plans since the decision to go SNA was confirmed once the IBM Time they currently have two hosts. a 3031 and a 158, at Bourn ville. Sharing Option and Virtual Machine Conversational Moni-

He conceded that VTAM had improved, but considered that It was still not reliable enough. He tor System had been rejected in has also found implementation of the 3705 front-ends and con-"The prime requirementa centrators to be timewere a system in which we ex- consuming, tricky, error-prene pected substantial future IBM and u weak link in the whole development, one which fea- concept, and thought the protured aomething like APL which cossor excessively big.

2200 MVP. The universal small business computer.



Wang would not be where it is today if it atill made dask top calculators rather than computers. Consistantly one of Amarica's top ten fastent growing companies Wang now boasts the accord largest installed base of small business avetame in North America.

Wang's 2200 series of computers covers 80% of the market's needs and the MVP is one of the latest processors in this series.

The multi-programming 2200MVP aupports up to eight terminals and can offer 256 Kbytes of main memory and 80 Mbytes of disc stotage, it can communicate as part of a network and with most maintrames, and like all Wang computers it allows easy expansion. Find out about the 2200 saries and its potential for your applications. There could be much more happening out there than you aver imagined.



Wang (UK) Limited Argyle House, Joal Street Northwood Hills, Middlesex Branch offices: London; 01:499 8169 Southern Northwood 28211 Midlands Rugby 78321 Northern: Harrogate 61381.

salaction in which skill, spilluds, mathematics and logical deduction all ploy a part, flois-playing featasy games. War games of all eres, Abetract games, Books and Magazinas. Writs lor FREE Catalogue to Oomas Cantro (CW10), 18 Hanway Streat, London W1 (01-638 9.278). Also at 2.

APPROVAL for the first major project in the UK to take DP into schools was wen from the Dapertment of Education and Reports from the US that ISM purchases computer system . . . The Univer-purchases computer system . . . sity Computing Co (UK) planned 90AC's worldwide semputer to install e second Univer 1108.

Ten years ago...

IBM orden From front page I believe there will also be 8120 and an 8110 below the it.

and 40 so far announced

Kutnick expected discor-

Kutnick.

for quantity Series I off either within a fortnight of fr next year and commented the wide range of potential a nincrs, among them word? cessing specialist Vydec, 1 only waiting for discount place a big order. He estima that 4,000 would have been livered by the end of the year

slimmed down detair machine based on the System,

nounced it in February and the

most significant annousar since the 370 which would go threat to the minimaken, .: cularly the smaller tore. models, he anticipated

in Britain in which new comranies con start and flourish. "Private capital doesn't really exist now," he said, "and though liurcaucrats are officially thinking 'small is beautiful,' they have little lilea how to achieve As for the City institutions and hanks, he said that they

IBM is to be one member of a showed a lack of understanding of high technology subjects and

urre driven too much by a de-sire to back only "racing cer-EAL has aircady taken two don. Impelus for the establishcompanies under its wing: Cambridge Electronic Workshop, be called the London Enterprise which manufactures sound systems and communications equipment, and Robel Elecronics, which is to produce

grouping of about ten new com-

panies under its umbrella over

the next five years, company

Murphy condemned buth

private and public sources for

failing to create an environment

chairman Dr Bernard "Pat

ment of such a working party, to Agency and to include Shell, Marks and Spencer and the Industrial and Commercial Finance Corp as well as IBM, has lt is looking to add about two oimed at reviving inner citles and beining small companies. companies a year, in each case and helping small companies.

Call for world probe into IBM bargaining with employees

ASTMS, is acted upon.

Speaking at an International lictalworkers Federation conference earlier this month in iencyn. Webb proposed that a inference involving IMF delegales from all over the world should start collecting informa-lion from IBM on its differing methods of negotiating with chinioyees.

some countries IBM has fmpliyer federations and In Sweden for example, it goes through unions. In some countries it just has staff agreements," sald Webb,

An IBM spokesman sald. 19M has collective agreements applying in all 18 countries of urope, including israel, in adtion, we negotiate company level agreementa in several

China's No 2 calls on ICL TWO ICL 1900s - a 1905 and a

People'a Rebublic. Vice-premier Wang has been companias in the high techno-logy, and defense fleids, inWinning the footbell pools is a gremmed machines to predict gambling genies dream to brighten the quick- the epperently unpredicteble.

In this article he discussion

How to come up

other day to a demonstration of OCR ScunData's clever acw machine that will read handwritten characters. A special attraction of the demo, the invitation said, will be the presence of Kenneth Warren MP, the well-known campaigner



ton. Interestingly enough, i

in the valleys

printer ribbons - it seems ewd and lascivious programming staff have been ising the council's computer to print out copies of the Ballad of Eskimo Nell, and even wait for it — pictures of Raquel

When shown one of the authority. To discover that this

Go forth and multiply...

PERUSING the latest edition of our industrial bible, the Computer Users' Year Book, I 614%. notice that over the last ten 171% and the number of com- man who aelis the shovels . .

"consultants etc" has gone up

Harry Belsey, of BP, has a years, while the number of in- choice phrose for this sort of stallations listed has increesed thing: "In the gold rush, it's the

LEASED LINES

We had lunch the other day with Frank "IAM" Cary, at the American Chamber of Commerce Unfortunetaly, I did not realise until too late, that there were to be 800 other people present as well Stiff, we were quite impressed and think ISM era going

J.R. hee decided to preduce a brochure, with photographs, about all of us in My suggestion that the Compeny should provide toupeas on e "Lesse A To basis left MRD unamused

The flavour this month is ISM Paripherats. We will buy, rent, leace, sell, exchange of W.H.Y. and have the following equipment for your delectation.

Peripharale 3420 Teps Crivse (all Modele and Control Units) 3330 Disc Crivse (Model 1 & 11) 3340 / 44 Olsc Drives 3830 Control Units 3211/3811 Printers & Centrol Unit

770/158 — ISC. ISM Memory, 2161, 2162, etc. 1SC. ISM Memory, Channels, etc.

If you have IRM equipment on raniel, don't buy it or send it back to IRM without contacting us first. We may be able to buy it from you under the SOL Plan and show you e profit whilet you take new equipment for your site.

MRO reminds me that you don't have to lease a computer from us — you can buy it maked JR has a 4 magabyte 3032 everybbe during March. 1979, for each of ISM

Dos-te-ost MPH



CA COMPUTER CAPITAL 2-4 KING STREET, ST. JAMES'S, LONDON SW1-TELEPHONE 01-830 036L TELEX 897949

Kenneth Warren WE received an invitation the for the computer industry in

"Mr Warren," we were told, "has expressed great interest In the new development from ScanData of Alpha Handprint OCR and has asked us to Include him in the whole of our Press conference and demonstration to get first-hand experience of Alpha Handprint

A pretty Impressive endorsement, eh?

Now, the invitation was sent out by a public relations firm called Parsons Tozer & Newfails to mention that one of the directors of Parsons Tozer & Newton is Kenneth Warren

Still, I'm sure Mr Warren won't mind me revealing this fact about his commercial int erests. After all he is chairman of the Freedom of Information

Keeping it clean

MRS WHITEHOUSE would be less forthright, "We're a good, proud, County councillors in clean-living community," he Powys are taking firm action said. There will be an lavesto stamp out the fifth that is tigation immediately and those coming from their computers. responsible will be taken to No, I don't mean finff from task. Good on yer, gentlemen When you have stuck your selves together again afte

being shattered, I'm sure we can rely on you to shore up public morals in Powys. Yo might tell the culprits that there is no point at all in using print-outs, Powys chief a computer for this sort of executive Thomes Young said, thing - suggest they use the council's copying machine in-

sort of thing is coming from our computer is shattering."

Councillor Jim Evans was no

By the way, can anyone tell me of a dirty authority where I can get a job?

puters 375%, the number of

by computer "individualisation" stage where a very interesting, if not to say very exciting, state of affairs the individual punter decides come about in a relatively new field of activity of computing — "unexpected draws" he will in-

programs for football pools. Our program for football pools, written in Basic, has been running for about eight weeks of. this season on an ICL 1900 sys- score-draw, but some of them tent. During the last four weeks we do not expect at all. This is It has achieved about 20 first dividends on the Treble Chance, in the league. and several hundred other dividends spread over all three

We take the view that some of of the leading football pools these games will turn out as

There may be more, but everyone who is successful does not necessarily tell us. But that there were at least 20 first dividends, we are sure, I will may go back to the be-

ginning of the story. With the development of heuristic methods in computing that enable the handling of oll sorts of conditiona of uncertainty, it was clear to me some years ago that we should be able to do a great deal better than chance on any sort of gambling, where some forni is available.

Ingames like roulette, or even more in the cose of fruit machines, there is little by way of fomt, and they are therefore probably fields hest left alone. This leaves quite a number of remaining fields and I will in this article concentrate on football

I wrote an early program for a computer some four years ago, but it did not work particularly well and I concluded that the heuristics very neurly guesses at the time) were inadequate.

I then spent some three years collecting o vast volume of "facts" about football results and constructed a set of Markovian type toblea for successive reaulta .home matchea, away matches, home and away natches mixed).

This revealed the errors in my original guesses and gave mc o firm foundation for making

pools forecasting which gave and R. weights to league position, last match reault, last-but-one match result and, if necessary, the result before that

A further lesser weighting took place for goal difference to try to diacriminate the scoredraw from the scoreleaa draw.

It was obvious from the first that any complete pool filled up. according to form elone would be useless. This is so because if every club played even approximately) to form, almost everyone would win and there would be very little in the win-

nings.
To deal with this very important problem we odd two further one inevitable) important steps to the total forecasting process. They are the kind of method used in actually filling up the pools form (we call it in sort) and examples of this are complete "perms", Lit-plens, V-plans, etc.

which sort he will use and which

on the pools-

Let me explain first the concept of an unexpected draw. We know that any game could be a where the best team in the league is at home to the worst team

score-draws and it is here where we shull introduce the first possibility of choice.

If we take some 10 games that no onc, certainly no pools expert helleves will be drows (this meana usualiv a home win is forecast) then we con take thom five at o time to sort together with the other forecast drawa.

The idea is clearly that we mix some uncertain forecasts; but much lesa often, with those that we really believe will be score-

We now come to the very important pnint of the sort, We have forecast, say, 18 matches, Relped by Dr Roger Hartley, I and we con labal theae A, B, C, D. wrote a new program for E, F, G, H, I, J, K, L, M, N, O, P, Q

We now, from these eighteen matchea, select 13, 14, 16 or 18 (or any other aubset of 18) where we place the Igforecast matches in order of priority. This makes it easy to pick out whatever subset

The organisation of the sort is such that we take every "expected draw" equally often or nearly so), and we combine these with one "unexpected draw" in each "line" column).

The main constraints on each line are that it should be composed of nine expected draws and one unexpected draw, and that in any set of 10 linea no two lines should have more then seven forecasts in common. We theo have a "complete perm" for

each line. each line.
The other phase of individual-teation, involves, using the hia-torical test and the "qualitative test". The historical test is self-

This quadrad test recent. draws or home wins in a fixture, last three home or away to. then we might expect them to and whether or not theye. Indeed the sequential ac-

is one step more sophist.

and shows, for example, it:

hest chance of a drawish.

team with a record Hill r

successive home wind the

an away team with HL !

strecessive away lossnip

ricked it gets suitable weg!:

The database of results

season is updated 1961.

prior to forecast and

undating includes the Pa

The last two games plans

Then the forecast is not

il il is less than eight

tracycling takes placet

the unulier up to eight

is done by relaxing t

tions for a score-di-

liciently to increase the

We then take the te

likely draws and mix then

the foreenst score-draws.

The lines of the chosen son

So it is that the prop-

updates the club record of a

tenin appearing on they

We are all the time and

lifting more information? mionitoring forecasts with eye to modifying the program when it is necessary. Its

has been, so far, a ceru

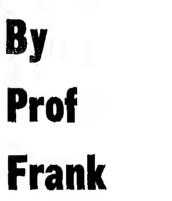
lorgerast score-draws.

"lengite" position

ant the three earliertess

In particular we niight expect to find "local derbys" coming out of draws, as the record book shows that they often do.

Then there is the fact that it we put "lost away" last game then we ought this is the socalled "Qualitative test") to distinguish losing 140 away to the top team as opposed to losing 7-0 away to the bottom leam; the -difference is fairly abylous.



George Now to the program, which sion, known as Forecast 4. It

amount of time tone! necessary, but no major this. we have enfield Forecust. We Professor George has set the huckground of the says hieve now got to ii fourth verill A Better Bet, and the lopopls in particular in a me includes the league table in the form of each club with a games called Forecast 3 (Foreign involves only migar char played/points acquired ratio. and both books are published and the computer clubs. Topaz Bnoks, High Sort! From this effective league table we go on to an apdated datohase, which shows inst result and inat-result-but-one, to Missendan, Buckinghi what we call the quadrad test.



Standards delay may limit Prestel revenue

DELAYS in reaching international agreements on vicwdata standards are being fusiered by some of the British Post Office's rivals to try to hold back the 2/3-year lead of the UK Presici system.
The Post Office pioneered

the viewdata concept as a

that personal files on computers

Scientist last week. The article

published report was described

y the Home Office as "specula-

Scientist, that all personal files

on computers, whether govern-

ment or private, would have to

he registered with the authority.

However, the authority would

have discretion to exempt sys-

tems from registration in cases

where it was not considered

it would be harder to exempt

AN EXPERIMENTAL voice

and retrieving meanages within

an office environment is in use

al IBM's Yorktown Heights

research centre in New York

The measagea are digitally stored on a 370/168 meinframe

with 100 Megabytes of disc

tem. The mainframe runa under

VM/CMS, and the voice net-

work system, which is deaigned

specifically for use with touch-

ione telephones, la controlled by

a System 7 process control com-

The exchange will be used by the French companies as the

basis for two new monufac-

luring facilities, and since the

still-birth of the much

negotinted Secimos project

(CW. October 19), this now represents the only aspect of the French government a "Le Plan

Composant" to become reality.

gabyte storage subays-

"necessary or helpful".

tion Committee recommends would be harmful.

according to the magazine New in this wny,

personni files should be handled contents. would be too inflexible and in. The wo

should be controlled largely by only computer systems, not

a Data Protection Authority minnual files, since the original

rather than by detailed laws, terms of reference were limited

giving detnils of the as yet un- other countries, there would not

hi accordance with the views to decide in the case of each

of some commentators that leg. system whether the operators

Islation specifying exactly how should be required to disclose its

sensitive to detail, the report recommends, according to New codes of practice established by

government systems than tion of the codes could be dealt

private ones, according to the with by the authority in formul

proposals. Police records would hearings short of going to court.

not be exempt, but those con- These hearings could pronounce

no ted to national security on users' obligations but would

would be the registered infor- not have the power to impose

mation would be open to the penalties. Appeals against DPA

tublic for inspection, except in decisions could be taken to the

the case of systems where the courts or to the Ombudsman.

Voice storage network

storage network for recording up for later retrieval by named

storage online with a separate aet are used to activate apecific

Motorola in exchange deal

with two French companies

AGREEMENT has finally been reached between Motorola and two French tompanies, the Sescosem division of Thomson and EFCIS, a joint venture batween Thomson and the French

ween Thomson and the French alonic energy agency, for a far-nulogy exchange (CW, September 14).

Motorola product capability beyond an existing agreement that covered the BB00 micro-processor.

In both cases, the French companies will manufacture de-

Two agreements have been from its own factory in Tou-

commands

now in use at IBM

formation service (pictured rightt and has already earned about £1 million in exporting its know-how and software to the West German, Dutch, Swiss and Hong Kong PTTs, with a number of other agreements due shortly.

'Data Protection body

should control personal

files held on computers'

The committee's report covers

In controst to what obtains in

be a general right of citizens to have necess to files about them.

It would be up to the authority

The workings of databanks

the authority. Breaches of a code

of practice would be criminal

offences for which the authority

court. The court would have

power to impose fines or impri-

sonment, and ulso make court

orders specifying what duta

users must do to comply with

Disputes over the interpreta-

Files of messages can be bullt

parties, and the system com-

presses long silences so that the

playback can be more fluent

han the original delivery.

Messages can be timed to be

delivered automatically at a

given telephone, and touch-tone

buttons on the telephone hand-

IBM has not said whether it

plans to market the system as a

IBM ia alao working on a

home computer which is based on vidaodisc storage and the

vices as second aources for

Motorola's product line, and sell

them in direct competition to

Motorola has made no

comment on whether it is to have a financial stake in the two

new companies, and denied sug-geations that it would be trans-

the US company,

the code of practice.

could take the offenders to

of Prestel International operations, pointed out at Press briefing Inst weck, "There is nothing magical about Prestel" and once the know-how had spread there would be little for the Post Office to export.

by stotute to govern the drafting

these would be: subjects of data

should know what information

there is about them and what

purpose it is being used for: data

should be accurate and relevant:

data should only be used for the purpose for which it was or-

iginally obtnined; datn users

should not be subjected to un-

the codes of conduct. Among

Meanwhile, the French, whose Anthope system could rival Prestel in the 80s. nre vigorously opposing accept ance as an international videotex standard of the Prestel character set, which is the ISO 64B basic character standard. The French are proposing the international reference version of ISO 64B, while the Germans recently suggested a compromise.

Comment, page 2.

viewdata services should have started in a number of countries. Yet the next full meeting of one of the major International telecommunications standards bodies, the CCITT,

will he In 1080,

● Viewdate news — page 64.

Two new word processors from Wang

TWO word processors have been announced by Wang, one at either end of its range of screen systems. At £6,350, the System 5 Is o low-cost standalone unit, end the Office Informailon System 140 is on extenslon of Wong's shared-logic machines allowing innre screens and greuter storage capacity.

daisy-wheel proportionalspacing printer that it manufactures itself, and a 425 lines per minute line printer. The xerographic printer is still under de-

The System 5 comprises a screen, twin floppy discs, and daisy-wheel printer. It under-

cuts the existing System IOA which has hitherto been the bottom end of Wang's ronge and will no longer be offered. Prices for the OIS/140 start et

about £20,000, and a sevenscreen system costs £45,000, making It fairly cheap compared with other makes of stand-

Heads of finance know AL ...do you?

dAL is active in many technologies, and disciplines. In data coronionications if it a world leader The IAL. capability is unique and the nature of the application. package it can provide is wide and continuously expanding

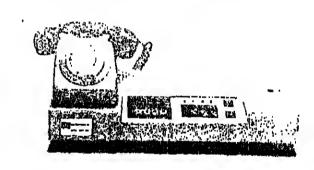
TAL numbers among its data communications clients the larger proportion of British clearing banks, several 1 international banks, and numerous major commercial organisations in the UK, Europe and throughout the world. With bases in 50 countries and subsidiaries and associates in 10 more, IAL is particularly qualified to provide an international service.

IAL designs, develops and manufactures, through its comprehensive range of production facilities, data communications network management and control systems. Much of its work is of a brilliantly innovative nature.

Take IAL Medius Medius is an outstanding example of IAL expertise.

A modular system, IAL Medius utilizes a revolutionary concept to identify and correct data transmission malfunctions and gives lingertip control of any size of

Visual indicators allow instant interpretations of system status, and drive modules are available which enable control to be exercised over any distance.



DIAL IAL For fuller information of IAL data communications management and control systems telephone: 01-574 2411 or write IAL, Aeradio House, Hayes Road, Southall, Middlesex, England UB2 5NJ. Telex: 24114 Cables: INTAERIO Southall



Aviation and Communications Systems and Services - worldwide

EDITED BY PETER HEWITT

Control over conversion costs

GILB'S MYTHODOLOGY

ALL critical system qualities can be apecified in advance of detailed system design. They can be quantified. They can be measured in practical and economic ways during all stages of development and ementation, et least with sufficient accuracy so as to give better result control than with other methods.

One of the critical qualities of any system is the portability, or conversion ability. We might be interested in immediate conversion ability of our present systems to our soon-to-be delivered mechines or software; or we might be Interested in controlling costs and human effort for our future hardware/software sys-

When I think about how important this factor is in economic terma, I am aurprised to see the informal treatment It Is given in practice. The normal method of hendling it is to throw a solution at the problem and hope It will go away. Common "solutions" are Cobol, Fortran and IBM. Unfortunately, although these solutions may be better than nothing, they give very uncer-

I have recorded a number of major financial disasters which were based on this assumption. For example Ford ended up paying \$2.3 million dollara to convert ita Cobol programs from IBM 360 to IBM 360 (ANS). Messey Ferguson,

do many in fact hanker for the

deys of twice-a-day testing

shots, albeit at the mercy of

abort-happy operators? And

which is in practice the more

These are the questions rulsed

by E. W. Tocher, of Southamp-

ton, who feels that online deve-

lopment is a path offering mnny

pitfells to I hoae without the dis-

"I could not agree more strongly with Professor Wirth

that 'interactIve logicel debug-

ging is the greatest destroyer of

cipline of batch experience.

offective?

Australian dollars on an MIS development because it was not sufficiently portable to other corporate IBM Cobol machines (particularly those without Virtual Storage).

of portability which we have used for several years now in system specifications and thia includes aeveral legally binding contracts. In one recent case where a corporate accounting package was guaranteed portable to my client'a "Computer with Cobol, from a major manufacturer' (which turned out to be an IBM 370/135), the supplier ended up paying a penalty of running the corporation's financial accounting package free of charge for one full year while he completed the necessary rewriting of the 50% Mark IV atatements to Cobol, for us, at

a nominal charge. You don't need to know exactly what you will be converting to, as this case illustrates, it is aufficient to know approximately. A portability measure must be specified in terms of source and target environment (both of which can be generalised) conversionmethod and means, and the application system in question. In addition it is vital to specify that performance, operational

maintainability also be kept at the same or better measurabla lavels as before conversion. Philips of Holland learned why the hard wey. Their original

PROGRAMMER

"I have often seen program-

mers using interactiva tools not

only wastefully but stupidly.

Making one-line changes and

result is not a route to deve-

loping a correct and well struc-

re-running in the hope of a clean

July 20)," writes Tocher.

nired program."

I have developed a measure

plan for conversion of a 200 engineer-man year project IMS database from IBM to Phllips computers specified three man-months effort. This worked, but the performance was 20 times worse and unac sion effort was in fact between ten and 20 man yeara (i got two estimetes from different

Another fact that many aeem to forget, howeve obvious It is: Conversion i more than Cobol or Fortran program logic. There are files to be converted, Job Control statements, machine language aubroutines, and supporting software auch aa database management software o telecommunications software. Then, of courae, there may be instructions operator recovery and other utility soft ware. One British installation reported 27,000 job control

statements to worry about. Portability can be quantified in terms of parcent salvage value. Ninety-five per cent portability between two environments means that only five per cent will have to be expended of what it would cost to build a new system without the benefit of direct conversion from the old logic.

One IBM user I know got £200,000 in cash and equipment from IBM because they knew how to get conversion_coats guaranteed measurebly.

tilled by Tocher as the "pre-

scriptiva dynamic" of many

for instance, you ere typically

logged out after 45 seconds if

you haven't made an entry. On a

busy syatem, it can be some

minutes before you are again

ries along terminal users, en-

couraging them to entar eny-

thing rether than be discon-

rationale of the machine con-

nected. This is an example of the

ditioning human users to work

One factor encouraging users at its pace — deatroying the helpful in their effective use?

"The system in this way hur-

"Under George 3 and MOP,

Get vours tool

timesharling systems.

given necess."

The pitfalls of online development

SOFTWARE FILE-1

Tandem offers end-use query language as extension of its DBMS

£1,000 per processor system.

A inferneode assist is also req-

nired to implement Tandem's

new networking capability.

Guardian/Expand, which was

(CW, November 9).

central processors.

nand facility.

announced at the same time

An extension of the operating

system, the networking subsys-

icm makes the location of com-

puting resources and databases

in an Exannd network trans-

parent to operators and pro-

grammers, it can support up to

255 processor systems, each site

Tondem's own communica-

tion protocol is used between

sites, but Expand also offers

support for virtual circuits on

X-25 packet-switched networks

Features of the system include

No adjustment is required to

current applications programs

to enable them to use the Ex-

Programs may access data

resident at any point in the sys-

consisting of up to 16 linked

March.

The Gospei

according

the Project

Manager

AND it come to pass by a Peper committed in United Plag Jerism which was feet

ered to it by the Resent A: ceme to it seying "Behalfe! Things were that reneal; the Prophet Dehts Minks which fives scross to We' end has Knowledgs at a

Things."
And the Paper repersiff

Innocent Enthusiase and as In fear of the West of the tent Editor and bis serie

Messenger which is etc.

Lhol'er.

(Apologies to Delegation of them's to the mean's aported that "The sign According to the high Menager" [Navembu ic Iginelly experted in matten's Issue let heir 1973 as "Generit, i'm 25"

2.5". Our source while

pletaly dillerent learn feiled to Identily the affi-Micheel L. Cotenso.)

has been announced by Tandem - database design. Computers as an extension of its relational database manage ment system Enscribe.

Called Enform, an unusual feature of the language is that it can be used from within application programs in addition to being invoked interactively from terminals.

Enform, which is nonprocedural, can therefore be used as a report generatur within programs written in Cobol, Fortran, or TAL - Tan-

dem's own application language. Reporting facilities, which include automatic sorting, also encompass the production of averages, percentages, and several levela of total. Input can be from multiple files, correlated

Puzzler

USING the digits i to 9 once automatic routing of data, with each, make up two numbers a tic-break algorithm where two which multiply together to give mutes are equally cost effective. the largest possible product. The first logical "try" is 9,876 times 54,321, but this produces a much lower total than the maximum. See page 01 for solution.

5), which required

$$B = \frac{C'D}{EF} + GH_{\overline{J}}^{I}$$

Enform carries a one-time licence for of £1,700 and requires costing £1,000 on each part a microcode add-on costing sor. Both will be available

 Nioll McPhIllips, of Dublin, has sent in no fewer than 40 different solutions to the "mixed fractions" Puzzler (CW, Octuber

$$AB\frac{C'D}{EF} + GH\frac{I}{J}$$

to equal 100. Maximum "difference" between the two aldes, according to his list, arises from the enswer

essential to good programming

Tocher notes that fixed

length, pre-allocated terminal

sessions also introduce distor-

tions to the development cycle.

tempted into trying to achieve

too much. Alternatively, If they

are over-prepared, the session

Online development systems

are now in widespread use. Du

others share Tocher's mis-

givings and what guidelines

have programmers found most

cnn be frustratingly short.".

"People are only too ensily

What's your line?

TIME SHARING BUREAUX who do not write a take franco

COMMERCIAL BUREAUX

MANUFACTURERS OF TERMINALS and their speries

LARGE COMPANIES with a parential telecommunication

ORGANISATIONS such as educational establishments who

MINI COMPUTER USERS

USERS OF WORD PROCESSING SYSTEMS ALONG MARKET THE PROCESSING ALONG MARKET THE PROCESSION ALONG MARKET THE

If you can identify with any of the above you should speaking to our specialists who are qualified to shise. study and recommend according to your needs.

MHS Remais personnel have considerable in-depth experience in the despited of all types of terminal based systems as well as microcomputer and workness. We ofter flexible remail facilities on a while range of equipment from leading 2.5. We ofter flexible remail facilities on a while range of equipment from leading 2.5. Texas, Digital, Transfata, Diablo, Owell Kekath Tektomis, Lear Segler, Midlectron, Hewlet-Packat.

For more information contact Mike Brooke, Telephone Byfied 495114

Specialists in the renting of terminal

M 65 Rentals, Aldwych House, Madeira Road, West By MINS Remain is the remail division of MasTermi

Wikes £795

2 Prince St., Bristol.

TEL. (0272) 290651

SOFTWARE FILE -2

German joint effort on DoD1 front end

This atrategy was outlined in

London last month by a speaker

at the Third Joint European/US

Software Management Con-

ference, Dr Horat Clausen, of

Industrieanlagen und Betriebs

Dr Clausen noted that a major

aim of the collaborative effort

was to avoid the emergence of a large number of mediocre trans-

lators for the language, which could be the result if companies

A high quality compller, pro-

ducing compact and efficient

code, was assential to the

acceptance of the language, he

each daveloped their own.

rently support Pearl.

Gesellschaft.

tobe planning a concerted effort to produce a portable front end compiler for the Pentagon's new

real time language, DoDI.

The alm of the project is to capitalise on German investment in its real time language Pearl while at the same time providing an easy route to using the new US language, currently described by the "Steelman" specification.

The envisaged front end will generate an intermediate code closely similar to Cimic, which Is the Intermediate code generated

Existing Cimic translators and Adapted for B1700

THE necounting and management Information systam Fact has been adapted by CMG for the Burroughs Bi700 series. Its general availability follows CMG's implementation of the system on a 96K Bi726 operated by packaging and printing firm J. Dring Ltd.

He added that there was no intention at the moment to force existing projects to use the new

A UK consulting subsidiary has been set up by

sion, hardware and software evaluation, standards

language, but that would be in-troduced on a trial basis on selected new developments. Although the DoD has annonneed its Intention to provide

Informatics' UK consultancy aims for big users

informatics, best known for its software products division in the US for many years and began to

including Mark IV. Called Informatics Consulting, offer the service in the UK in the middle of last

its principal clients will be large IBM, ICL, Honey- year. Projects to date have focussed particularly

development, systems design, and project control. Kingsway, London, WC2. Tel: 01-405 8546.

Services offered will include systems conver- educational courses on IMS.

thus provide a bridge to the implementation of Steelman on all the machines which cur-

A common front-end, such as already exists for RTL/2 and Systems Designer's portable way to enforce language atandardisation and could well be the approach taken by the

Honeywell data dictionary

Called IDS/1-DD, the aystem la said to analyse aource programs to provida information on data element usage. Dictionary indexes, where-used lists, and database chain definitions are among the many reporting functiona aupported.

The package ia also reported

Informatics has operated a professional services

on database management systems, including

The operation is based at Africa House, 64-78

Fortran Forum lookings for the Fortren Forum

for routeing

the NCC's Software Product Scheme (see right) is e vehicle routeing end scheduling system developed by Scicon Consult-

Called Vsrplen, the system has been spaciely designed for compenies running a fleet of vohicles with multi-drop do ivery routes. It is written in Fortren IV for operation on a DEC PDP-11 under R\$X-11M and is licensed at a basic price of £15,000 for five years.

A DATA dictionary has bean tion programs and the collection introduced by Honeywell for use and evaluation of database per-with its IDS/I database formance statistics. These facilmanagement system on large-scale Series 6000 and Leval 66 itlea are presumably directed at the restructuring of a database the restructuring of a database in the light of actual uaage

Requiring 192K of memory for mentation, the package is to be released in the US by the end of the year at a price of \$14,500. The company is said to have given no indication of plans for a similar offering under its more recent DBMS, tDS/2.

(Lettara, November 2), organ-ised by the SCS Fortren Specialist Group at Imperial Collego, London, on Friday, De-cember 1, should be mede with John Roberts-Jones, c/o Mies Laura Burrell, BCS, 13 Mane

Latest pack NCC scheme extended to emerge is to cover limited hardware development

LIMITED hardware development can now be funded by the around £180,000 for this deve-NCC's Software Products lopment, with a similar sum Scheme in the context of pack coming from the NRDC. aged hardware/aoftware sys-On the subject of funding tems. And the scheme is making proposals, Ford remarked that it easier for firms to apply for a the mechanism had always been

puters, and microcomputera.

to encompass packaged hardware/software systems. We

boards or terminals, he added.

The scheme's other major in-

General's Micro Nova.

grant, by funding up to 50% of there, but it had not received the costs of proposing to it.
SPS is administered by the much emphasia before this year. "Previously, wa felt that if a National Computing Centre on bahalf of the Department of industry. It can provide up to 50% wouldn't feel that the product of the investment needed to de- was its own. velop a software product in

"if the end product for a feasibility atudy is a proposal, there is a danger that it will be return for a ahare of eventual "Originally, all our projects written for the cilent. We regard were concarned with utility it as very important that e firm software for mainframea. aces the proposed product ealts commented the NCC's Fred own, and is not influenced by Ford, "With the changing marldeaa of what we might find ketplace, we have been inacceptable."

Ford added that SPS had creasingly involved with applipart-funded two proposals this year and had been pleased that cations software, minicom-"Early this yaar, there was a its fears hadn't materialiaed. definite extension to the scheme

Tax exemption

can back such aystems as long as there isn't too much hardware PROPRIETARY software packages have been exempted from the newly-introduced General Typical hardware aspects of such a project might be the de- Sales Tax In South Africa. velopment of apecial interface Revenue authoritics for a while regarded software packages as SPS is currently assisting two tangible goods and therefore eligible for the 4% tax which companies to develop microbased packages, one built on the came into effect in July. LSI-11, the other on Data

Following a representation on behalf of the software industry. the Receiver of Revenue has volvement with microproces- decided that the tax does not sors was blacking CAP's Micro- apply to these products after all.

DECservice, it doesn't just promise total service commitment. It guarantees it.

DECservice sets e new etandard of Reeponse. Promising to answer your commitment unique in the computer industry. DECservice's feetures make it the price/performance leeder in the merket

Make comparisons. Ask around. See if any other computer company is prepared to guerantee all these vital points n ils service agreement.

We guarantee to be on-site in four hours maximum. That's different.

Za Continuoue effort. We will not stop working until your machine is back in operation. We guarantee it.

J■ Action Outage A guarantee of menagement involvement to ensure effective repair of your system, through en elerting procedure extending to the highest levels of our international network. it guarantees thet all our specialised resources ere put at your disposei.

repair times over e specified period. it guerentees preventive action.

Personalised service. An accountresponsible engineer will be assigned to your system: our force of more than 2000 engineers in Europe enables us to make this guarentee.

To get compreheneve information about DECservice, use the coupon.

Address Send to: Digital Equipment Co. Ltd. Attn: Field Service Menager Digital House, 252-256 Kings Road

Reading, RG1 4H4

Digital Equipment Co. Limited

the missing link. Forging a computer system is a skilled job. Selecting Whether the system should be based on a micro, mini a computer, negotiating with suppliers, designing and or meintrame computer, run in-house or through a bureau, developing soltware, instelling equipment and Ireining CMG consultants era able to handle the entire project from stall requires specielist experience.

CMG consultants link your data processing

needs with eknowledge of the realities of practical data processing to select the best solution. Do we naed a computer? Which computer do

questions to which CMG consultants have the enswers.

we need? How can the date we have be turned into useful information? Areoni data processing operations selisfactory now and for the future, Just a few of the many

beginning to end.

further details of this service.

business card to:. CMG (UK) Limited Croydon, CR9 9EB.

London Amsterdam Frankfurt

Send for the free CMG booklet which provides No stamp needed - just write or send your

Tel: 01:681 7631 Rotterdem · Brussels · Glasgow

OP SPOT

Central contact point between programmers users and operations

person say that her work in. At present Janet is responsible ment volves "taking my operations for six systems which are in the knowledge and using it to the process of development; four are each project at its design stage.

learn that her experience totals . A project committee is formed some five years in the industry for each new application. Proand includes a spell as an opera- gramming, users and operations,

Isnet Hall ie the person I am other processing liolson analyst, talking about. She is employed are all represented. as a processing lloison analyst of the Stratford, London, installa- closely with the project team

'When I saw Morgan that of operations. Guaranty advertising the posi- Another part of Janet's work tion in which I am now is to ensure that the documenemployed, I thought they must tation produced for use by have the right attitude to opera- operations is of a sufficiently tors and decided to give them a try." she said.

Her role involves liaising bet - the operations documentation is ween operations, programming up to scratch. To see that it has and the users. (Unfortunately, many sites fail to recognise the need to run the work," she aaid, benefita to be gained by She is also responsible for enemploying someone to carry out suring that the operators are

Said Janet, "Actually, there well in advance of the time when are two of us. The guy I work they actually go "livc." with is responsible for long-term plenning and I'm responsible for gives the operators a good it in the short term. We set out to understanding of all the appliensure that all new opplications cations and so greatly reduces

Sami intalligent, up to 8 pagae ol

Centronics 779 Printer

Flexibla 60-110 cps printer

Micro 800 Data Concentrator

Permits up to 8 terminals to shere one tslephona lins.

Lear Slegler

ADM 42

large online applications and the And it gets better when you other two are general systems.

in the person of Janet or the

This enables her to work tion of Morgan Guaranty Truat. And the users to their benefit and

high standard.

"It's up to us to ensure that all all the information the operators

lectured on all new applications, Attention in these two areas

Techtran 950 Microdisc

Mass atoraga, Intalligent data

Teletype 43

Portable /T



Janet becomes involved with This enables her to draw upon her experience and interpret the system in terms of machine

a new disc or magnetic tape they come directly to us and not to the operators."

New for COMPEC from Peripheral Hardware Ltd.

requirements.
She also acts as the "central

contact point for all the project committees, the Morgan teams. For example, if they need Guaranty Trust site ensures that Thus the operators get no in-

terruptions from outside the computer room, and are able to concentrate on running the sys-1em and optimising throughput. Now in the main, users have little idea of what goes on In the

volving them in the project

hey understand what happens and have the opportunity to put their views and problems for-And Janet Hall ensures that the needs of the users are met and that the addition of new

HINT OF THE WEEK

By Bernard Allen

accepted norm, operations staff can do much to incress the fight knowledge of the equipment with which they work. Sometimes they will find ways to oses their own task and age

Sometimes they will rind ways to ease their own task and eath their company to economise in terms of money costs.

I make these points efter considering e hint relating to printer and wasr and teer on printer ribbons, which is sent by Mr T. Turnerweb operations controller at e site in Derbyshire.

Ha seys, "We do not have e great demand for printed output and k we use en iCL (Singer) 2412/01 printer which has 132 print politics."

and produces 150 lines of output per minute." For over a year they had problems with the ribbons, which was ride up inside the carriage. This lad to unaven weer and unit weeks.

He continues. 'Wa were told by the ICI engineers who are excellent in all other respects to try some different ribbons for all es they were concerned, the problem was insoluble." This they did, but with little success "es the usege varied between 17 and 50 hours per ribbon." So they looked up iCt's Harden Operating manual (figure 29, page 53) and examined the unit.

He explains. "The problem occurred as the ribbon passed below the guide posts of the printer's carriage." Now, the guide posts ere on a csm and can be edjusted vis to

ockets by means of en silan key. lockets by means or en shen key.

He seys, "The guids posts can be engled end, by experimening it can be engled end, by experimening it can be engled end, by experimening it is engled end.

By this means they overceme the problem end "we are new pidy ver 100 hours' use from each ribbon," he edds. "The existence of these sockets on the guide posts is not mention." anywhers end does not seem to be known to the engineer. Sad adjustment is simple end quick, end you don't even got your fryst

begin st the highest availt.

address, the second job at re:

the next 25K. After this #27

tor is given two hatch job.

requiring 30K, which hese

sturied immediately. Hr. .

time sharing application.

uses up another 400K. h

20K at the bottom end.

Now, all the small job:

tasks, run for a comparate

short time and when they i:

we have three packets of 5

storage. To do this would me

interrupting the service to the systems and Table

lead to complaints from the

to the system and she

Next the main consoker

It's possible that a WATE

next highest and so on.

The laser disc that can hold 10,000 million bits

numbers of digitised images to be mixed on the same disc with alphanumeric data.

45,000

tracks joined

in a spiral

The Ireneparent 12in disc used

in the Philips diode laser recorder holds 45,000 trecks

oined together in a spirel and

the tracks (see right) take the form of grooves one sighth of a

wevelongth deep which enable the heed to count its way to the

track required. Each of the Iracks is divided

nio 128 individually addres-

sable sectors, and date can be read or written at 300K user bits

per second at the current

tendere disc rotation speed of

2.5 revolutions per second.

Kowever, the revolutions can

be increesed end Philips says

that dats has been reed and

written at six million user bits

per second. The 12 inch diec cen hold up

to 500,000 A4 sized pages of elphanumeric information.

Philips has slee developed a

mini version of the disc mes-

can hold up to 50,000 pages.

sides of a single 12-inch disc using a compact significantly.

recording methods like tape, disc and COM holes one micron in diameter in a tellurium recording its gradually emerging from the laboratories of Philips in the form of a diode used at a lower power to read data, and the laser optical recording system. Its very high mean time at the moment of accessing a recurding density should enable large particular address on the disc is 250 milliseconds, although Philips is confident that this time can be reduced to about 70 The Philips system can alrendy cram an milliseconds. The company is also sure that impressive 10,000 million bits on to the two the recording density can be increased

system compared with magnetic disc drives is that data cannot be erased after it has been written, although Philips believes that the enormous capacity of its disc should enable records to be rewritten on another part of the disc after they have been updated. The disc could provide a small business with enough space for a year's Philips says that it is developing

software now to enable the disc to be used with commercial computer systems, although the manager of Philips Data Systems Division, Pleter de Voa, stresses that the disc will not become generally available to users for another two years at

Phllips sees the laser disc as heing particularly suitable for storing images, because of its luge bit capacity, and envisages it being used in the oft-discussed electronic office as an "electronic filing cabinet" holding facsimile images as well as alphanumerical informstion currently held on paper, microfilm and magnetic medla.

Philips was provided with a head stert in developing a digital laser recording disc by Video duct soon to be put on the market that uses a compact lowpowered laser to play back audio and video. The discs are pressings manufactured by Philips from masters created using special high powered laser

In producing a digital recorder that could be used with computers, Philips had the problem of developing a compact laser that could write as well os read Information. The solution wos provided by the cumpany's semiconductor division which produced a dlode laser dispute with another company. employing a chip measuring Pick & Associates, over owneronly 0.1 mm square.

ship of the Reality software. The chip is housed in a read/ Pick is importing intertechnique minis from France in order to write head that can fit in the palm of a hand and which olso market a system which runs a contains all the optics for direcling the beam on to the disc and the reflected beam on to signal Microdata has made no detectors. The head, in turn, le comment on the bld beyond mounted on the end of an arm saying that it was under conthat moves the head radially



Perils of core fragmentation under MVI

SEVERAL weeks sgo (Op Spot, fixed number of tasks) and OS/ bit inflexible. Each time he of the IBM OS operating system. And this week I would like to give further consideration to the characteristica of, and differences between, the two verslons of the system: OS/MFT

Teletype43BKP Buffered | FAGINIAN

Up to 20K buffer for sanding,

Techtran 8400 Data Cassette

High spaad seerch & aditing

Teletype 43 Friction Feed

racalving & editing.

MVT (multi-programming with wishes to alter the way in which a variable number of tasks).

applications does not impair the

service they receive from the

Is divided into a number of fixed PARTITIONS each of which supports one lob at a time.

The 132 character per line display.

A-J 211 Accoustic Coupler

Accomodates nearly ell telaphon

Anadex DP 8000

Vsry low coet 80 col printer

11 1 : 6 : 1

Widest choice of Industry Standard Products

LA180

£1700

Now MFT is, perhaps, easier conform to installation the likelihood of errors occur- (multi-programming with a for the operator to run but is a

the PARTITIONS are set up he With the former, main storage has to use the OEFINE command and follow a somewhat cumbersome procedure. Under MVT, PARTITIONS

claim, say 25K. Then a MCM are replaced by INITIATORS which take jobs from the input queue and allocate main network goes in and out; storuge, along with other system resources, in accordance with 500K. the needs of each job. Thus the perator merely has to START ind STOP INITIATORS as re-

But problems can occur under MVT, for poor operating or scheduling can cause main storage to become "fragmented" point main storage is M: and preos of it to become unusable. This is commonly known as "core fragmentation."

To understand the root of the ner in which the INITIATOR main storage of 50K, 60k i problem, let's consider the muittakes jobs from the input queue and allocates main storage.

Scarching from high address to low, the INITIATOR attempts to find continuous block of storage large cnnugh to support the job concerned.

Let's take an exumple. It's the

Microdata \$47m takeover bid THE complex affairs of Micro-

data licences.

the Conlinent.

data Corp (CW, November 9) have taken another twist with a bul for the California minimaker company from offset litho and addressing machine specialist Addressograph-Multigraph. The bid, of one A-M share for

each of Microdata's 2.3 million shares outstanding, values the company at about \$47.2 million. In its year to August 31, Micro-data reported profits of \$4.1 million on turnover of \$65 million.

Starting out as an OEM minimaker with MAI as a major customer for its Basic Four line of business systems until 1973. Microdata branched out into the configured products market with the Reallty business systent. Models in the Multi series made by Intertechnique of

Oil service

AN online stock control eystem has been implemented by Jenson Computer Services, of Bria-tol, for EPD Servicea Ltd In Aberdeen. The system, based on a DEC PDP-11, is being used by EPD to provide a bureau service to oil companies operating under the North Sea.

pstead and the new Microdata Royale file handling system. Datasaab

man switches

Microdata acquired CMC-UK

CMC-UK already marketed

last year and expressed interest

in acquiring CMC companies on

the Microdata Reality aystem, and also sells the CMC 5000

series of key-to-disc systems

which it builds at Hemel Hem-

WALLY WELLS, who is prominent in the UK banking outo-mation scene, is leaving Data-base UK after four years to teke responsibility for merksting administration and asias for General Automation's bankin systems products in the UK.

As well as being one of the three epproved suppliers of SIDs, Swift interfect devices, for the international c transfer natwork, Ganera Automation also marksts i foreign exchange system calls:

'Industrial democracy only way to meet new technology

INDUSTRIAL democracy hae similar to those of the UK been highlighted as the only vi- Employment Miniater, Albert able way to meet the challenge Booth last month (CW, October of technological change in Australia in a speech by Nell Batt, the Australian Labour Party's president, who indicated right of unions to be consulted that a future Labour government would seek it as a price for allowing such changes to occur

version of the software.

12) when Booth stated that he believed legislation should be formulated, acknowledging the prior to the introduction of new technology into any organisa-

.The main pointe of Batt'a. Speaking to delegates at a spaech ware that the paople seminar on technology and in-dustrial democracy, in Mel-bourne, Batt showed attitudes. volvad in any changes; that - Australla was presently experiencing "disturbing" technological changes; and that the best way to counter the negative effects of these events was the proper application of inc

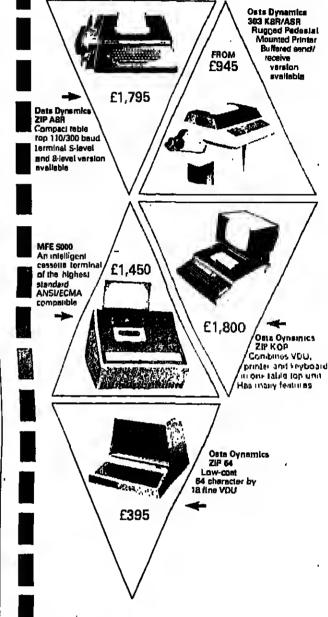
Fast storage for DEC users

A PRODUCT which gives DEC PDP-11/70 users an alternative source of high volume, high eource of high volume, high speed subsidiary storage devices has been announced by System Industries (Europe). It is based on a apecial version of the Midaa 9400 controller, and offers a discount of up to 50% on the equivalent DEC peripherale.

One-off cubsystem prices are £12,750 for an 80 Megabyte system with 11,770 cache bus interface and RP04 emulator, and £17,450 for a 300 Megabyte version. Quaptity discounts are available.

BUY RENT OR LEASE

COMPUTER AND COMMUNICATIONS **TERMINALS**



Many other items available including LA-36 DECwriters (£845), and Teletype 43 (£875).

Tick Box Required			
	NES CHAMES NES LIPE DE LA CONTRACTION MES SE	SON SECRETARIAN SE	1
Company Position Address		a a taga a a a a a a a a a a a a a a a a a a	
Tel. No Data House Tel: 01-848	Springfield Road	i Hayes, Mid	dx.
	Byn	amics	

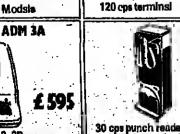
MARKET MICE Data Dynamics Group

See us on Stand A2



Also ASR and RO Modsle





OI-941 4806 Wetherby 61885 Dublin 971854



Portabla multi copy impact printsr in a ruggad case.

£1995

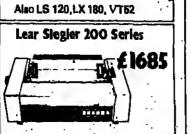




180 cps printsr



digital



LA36





2tilk, respectively. What it all amounts to 61 although 130K is not bengue John needing over 80% cannot run by the system. This he ulsruptive effect on throught-The way around this site Is to close down time shar! and TP and re-start them. suring that thay are allot storage at the top end of ri

start of the day at un installation und the system has been louded but no work has been sturted. It's a hig sita ond so there are scinrate work arons for the printers and disc drives, with the card readers and tupe decks placed neor, and tended by, the

main console operator. So to get things moving, the operators in the disc area start display units and eyestims ssuing commands to MOUNT discs (the MOUNT runa as a task in storage), the staff in the printer area atart some WRIT-ER procedures, which allocate printers to output classes, and the main consols consols and the main consols and the main consols and the main consols and the main consols are the main consols and the main consols are the main consols and the main consols are th the main console operator feeds some jobs into the card reader of Human Sciences, into and calls some procedures from

VDUs and Vision display units and eyeste theme of a conference to on December 15 at Loss rough University of Tellos by the Ergonomics Sockits of Technology, Lough Leicester LET 3TU.

Good Data Control Staf halp satisfy users and achiva a smooth, frouble-

free operation. Infotech Operations trains Data Controllers Call Jenny Woodhams for details 0628 3503

Infotech Operations Ltd n House Maidenhead, Br

NORD - the reliable system ahead of its time

A NORD is ready to grow with your work.



NORD - for a flexible future Richard Norton (NORD) Ltd. NORD House, 17 Galle Strae). London N1. Tel.: 01-2785501, lelax: 299 537

ALL HAIL, THAVE OF IFIP!

THANK YE - AND WELCOME TO SILL CON GLEN!

manager for advanced systems in the Mediterranean region.
Curran's career in computing began when he left university in the HS and went as a systems programmer to Mobil, which sent him first to Libyn, then to Italy. In 1970 he left Mobil and, still he lialy, worked as a private systems consultant for large 19M users, for-

I SEE THE

STARTED

2

CURLING

SEASON'S

ming his own company in 1975. He joined had in 1977 as systems engineering mannger in the responsibilities cover not only eleven European countries, but also Israel and the Middle East.

European

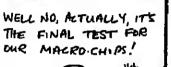
AT Hel International, John Curran

has been prounted to European director of marketing services. His previous job was that of merketing

director

at Itel

Mike Pegg has become manager of special responsibility for the VS computer. He is replaced es Southern branch manager by Alen Dovls, who was a Top Achlever salesmon with the company.















Michael Soyer has joined Rain

Ferminals as a sales engineer for the DECwriter, Diablo and Bazeltine ter-

minals and the Black Box micro. His

last joh was as manufacturing pro-

Peter Glibert, formerly branch

systems support mnnager for the North-West of Britain and Northern

ireland with Burroughs, has been

appointed systems and program-ming manager of Computer Facil-

giam controller with GEC.

PEOPLE AND EVENTS

Twentieth anniversary

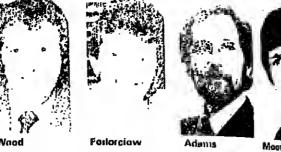
THE Conference on Date Sys-tems Langueges (Codasyl) is to celebrete 20 years of operation with a two-doy meeting in Arling-ton, Virginie, next May. The focus of the meeting will be Codasyl's inpoct on the uear communit which begen with its initiative to develop Cobol in Mey, 1959.

More recently, Codesyl hes been best known for its recom tione on detabese menege ment systems end earlier this yea sunchad a new project to doveop e aranderd job control lenguege (CW, Merch 16).

Further Information on the eeting is aveilable from Mr. Nonnie Robertson, Honeywell Information Systems, 7900 Westperk Drivs, McLesn Virginie 22102, USA.

vice manager of the clock and watch division of Smiths Industries. Clive Jones and Alex Rey, of Cillbank, both formerly resident vice-presidents, have been promoted, respectively, to vice president in the personnel group and vice-president in the operating

George Clay has been appointed engineering manager of Beckman instruments. He was previously ser-



Edited by Nancy Pocock

John Fisher, who was a field s-Buh Fedorciow, previously an analyst/programmer at Sale Com-Occumentager of Gen Rad, has been Borer Electronics as a sales engine Dave Curl becomes a technical or puting, and Alun Wood, former Datashil safes executive, have be-

party; previously he was made At Horer Data Systems, Roger product application engineer, ag Adnus has become sales manager. Previously be worked for the parent Alan Moore has become finual controller with Memory Irely! Previously he was audit many with chartered accountants Coop. commany, Horer Electronics of Switness analyst with BOC Gases Divi-

come sales executives with Safe.

Derek Stroth, now linaucial con-troller of Rediton Computers, was Huy Boreham, formerly a fac-sales manager with Ultrasomelya Systems, has become a me previously in the same position with the AEC plant of Leyland Vehicles. Owen Smith joins Redifon as senior Hampshire, Surrey and some and of Greater London. territory manager for the financial hrnneh of central accounts, from

New address

pairt specialist with the same ce-

John Burrett joins Dymo Business Systems as national sales manager, SYSTEMS and programming of tractor IPS Information Process Farrington division, from Data Card where he was plastic could division Services has moved to new offer specialist. len Johnson and Nell GD. The Crescent, Plymo Walte become international sales managers with Dynox themouth 24302.

The use of Mumps in the St. Health Service, seninar BONG of onelout Group, Landon St.

Hygiene & Frequeal Medicar b We I Apply before Rosents o County, lef Juentwood 25 fee.

Topes frontlent and use of epi-temace, analogue/digital conver-logming II-I. Seroy Place logi-in/31 Register with IEF-01-28" Record developments to on process control calleguent in 14-ce, 1 onton WC2, 1030 Rg., 14-c, 11-240 1871.

.: कुल विभागताच्या ज्ञाती एउट जी लहें ;

NOVI-MIIER 27

lonterey, California. OVEMBER 20 Computer languages, the way alread, Lony Boare BUS Nottingham branch, Themstey Bidg, Nottinghum Purversity,

omerical complexity seminar. Prof A. von Willigaarden Diffversity of Manchester Computer Bldg, University of Manchester, 14.30.

NOVEMBER 20-22

Ocyclopments in distribution switchgear, conference, IEE/IEEE/IMA, Savoy Place, Landon WC2, Register with IEE. European data communications redicy.

Mining, a general solution to the local

urea network problem. Dr. G. D. Caliv. RA'S Morllag, BCS Data Communifra-tions Group Polytrechnic of Central For-don, London W. 1800.

Follable communication systems, cid-logurum IERE, Royal histitution, London WI 10.00, Registration necessary, phone

WI 10.00, Registration necessary, phone to 598,0071, ext 16.
Formal specification of organisations R. Sinnper BCS Formal Aspects of Computing Science Group, Polyrechule of Central London, Landon Wt 18-30.
How decisions get made to managing projects, seminar Association of Project Managers, Wildorf Hotel, London WC2, 10.00, Ustalls APM, td 799-3152.
Newspaner surgical, rust, present and

Newspaper sitrified, pust, present and the electronic challenge. I. Lindsay sinth, IEE, Savoy Place, London WC2. Microprocessors, IEE, King Edward Grammar School, Chetinsford, Essex.

18.00.

Array processing, M. Ruyliss, UCS
Chelienham & Glos bunch, Gala Clirb,
Falimile Gdns, Gloucester, 19.30.

Presidential visit, Prof Frank Summer,
BCS N Staffs branch, Cluyton Ludge
Hotel, Newcastlo-under-Lyme, 20.0h.
Note change of venue,
Public data networks, O. Hebdlich, &CS
Ludd, benoch, Perkway, Hotel Leads Leeds branch, Parkway Hotel, Leeds

Word processing, BCS Aberdeen branch, College of Commerce, Aberdaen.

NOVEMBER 21-22 NOVEMBER 21-22
Siluctured aystems development and quality control seminar. John Parker. BCS London branch. London SW7. Register: Christine Moulang 01-637 0471.

NOVEMBER 22

Oalsbase management systems and nformation retileval. Elizabeth Anira-lough, Prof Peter King. ACS Information

Visit to Ford Motor Co. BCS Hempshire Visit to Ford Motor Co. BCS Hempshire branch Sweything, Southampton, 14.00. Information engineering and electronics. F. J. M. Laver. ICE/IERE: St. Mary's College, Chaitenham. 19.00. Oktobasa. I. Oraffan. BCS Teesalde branch. Teesalds Polytechnic, Middlashmuch. 18.00.

braigh, 18.00.

Programming languages I. Or J. Larmouth, J. Lucking, Polytechnic of Wales/
BCS S Wales brench, Polytechnic of Wales, Treforest, 14.15. Octalls (0443) 405133.

Electronic funds transfer, the role of Bankers Automated Clearing Services. R. Hope-Smith. BCS Wolverhampton brench. The Polytechnic, Wolverhamp-

tion 18,30.
Visit to Monchester Computer Workshop, 8CS Monchester branch, Henging Otteh, Memohaster, 19,00, Numbers limited contact R. Beker, 061-928 5471.

The use of computer graphics in televi-sion, Colin Cheesiaan, BCS Lidinburgh branch, Moumbauen Bidg, Hertor Walt University, Edinburgh, 17.10.

Olivetti where he was an account

Database management systems and Information refrieval, Prof. Beter Joint, Disabeth Barraelungh BCS Information Retileval Group/Ashb Informatics, City Informaty, London FCC 1430 Th kets El Mayine Met afferty, tot 01/828/4861

NUVEMBER 22-23 Local Authorities Group meeting, 1904 Computer Decis' Association, Town Hall, Fulbol Road, Stiefford, Lanes.

NOYEMUER 23 Unline stock recording at Perkins I n gues. Billish Production and Inventory Countyl Society, Royal Overseas League.

New technology and as effect of baser printers and demonstrated a sing to S Microlom Group 802. Manylelame Road, London 2181, 184.

TARIFFS Imposed by the EEC problem faoing his members was tronles components menufec-turers in Europs to mest our in-dustry's needs for elsotronic micro-circuits," requiring them to be imported egainst these high

Xerox Alto at the

hom was the prototype of a new product about to be put on the market appears to be incorrect.

A great deal of sophisticated text processing software has Ethernet, has been constructed real marketplace, producing advanced office systems and doing

to connect all the units at PARC

together, and a minimal five

Megabit Ethernet is linking the

two machines that have been

installed on an experimental

basis in the Executive Office

Xerox would not consider sel-

ling Altos as general purpose

minicomputers, if only because

it has already withdrawn from

the computer business with the selling of Xerox Data Systems.

and has no support organisation

left. To be used as part of an

office system product, the Alto

would have to be re-engineered

and modernised considerably; it

was not after all designed as a

product and its components are

expensive. It is microcoded to

emulate a Data General Nova.

which is not particularly

The machine is still ostensibly

secret, although it has been used by a good number of Californian

schoolchildren for learning ex-

periments, and one has been

given to the University of Roch-

ester, New York, near Xerox's

A new manager has been

appointed for the prestigious

Pnio Atto centre. He is Robert

Business Systems, He reptaces

George Pake, who moves on to

head all of Xerox's corporate

PARC concentrates on deve-

UK launch of

OCR scanner

AN Intel 8080-based OCR scan-

ner from Hendrix in the US has

been launched in the UK by

General Audio and Data Communications of Tring, Herts, for £9,000 to £11,000, depending on

Called the Typerender, it reads OCR-A and OCR-B typefaces

in telex, typesetting or word processing applications.

interfaces.

within the company. ASTMS already has bargaining rights for NCR field engineers, but it is not seen to be seen

EEC tariffs result in

Spinrad, who has hitherto been

working in El Segundo, a suburb of Los Angeles, on the development of new products for Xerox

relevant for a product.

main base.

Building in Washington.

White House

cluding the Smulltalk interac-

tive language (CW, December 1,

NEWS IN BRIEF

APPLICATIONS received so far

this year for places on university

computer science courses are

the higher than at this time last

year, according to the Universities Central Council on Admia-

sions. Engineering courses are

also more popular, with a 38% increase. Overall, 5% more wo-

men have applied to UCCA, but

ESTABLISHMENT of a national

Japanese database covering scientific, medical, politicat and economic abstracts has been

proposed by the Japanese Min-

ster of Posts and Telecom-

munications, Yasushi Hattori.

Acknowledging Japan's weak-ness in the field, the Minister

proposes that methodology and information retrieval software

should be acquired from one of the large US database operators like Lockheed or the Library of

IHI US timesharing bureau.

Comshare inc of Ann Arbor.

Michigan, has entered negotia-

lions with Polysar, the Canadian government's development or-

ganisation, that could lead to the

Comshare Ltd. the London based bureau. The UK firm is

currently owned jointly by Po-lysar and Comshare Inc.

A BALLOT of NCR employees now looks likely after the intervention of the independent arbitration body ACAS into the bid by ASTMS to gain further recognition and provided the statement of the st

recognition and representation

now seeking to represent all

NCR ballot likely

US firm taking a 100% holding In

Takeover talks

Japan database

Popular

courses

3.6% fewer men.

BETA has been protesting shout the increasing practice of local authorities of forming urchasing consortis which then impose "oneroue" end "uncom-marcial" terms in their orders for supplies. An example of this would be an authority ordering goods estantibly for itself and then announcing that some of the goods are to be delivered to a different authority and the second and the second authority and the second authority autho ferent authority at the other end of the country.

BETA compleins that if suppilers were to band together in this way they would be in breach of the Restrictive Trades Prec-tices Act. However, the essociation reports zoms progress in persueding local authorities to se more reasonably in this respect.

REPORTS from the US indicate that the Xerox text processing machines on trial in President Carter's office are in fact Alto minicomputers, and not a new product as had been supposed (CW, August 24). Since the Alto is a research machine and is now four years old, the assumption by many observers that The Alto was designed at Xernx's Palo Alto Research Centre specifically for use by staff there, as a mick way of hootstrapping the firm into R&D on advanced text handling. It is a mini with a high-resolution bit map display, which means that each point on the screen chrresponds to a bit in high-resolution bit map display, which means that each point on the screen chriesponds to a bit in nemory. During each screen refresh cycle the memory is read and the information transferred to the screen. This gives great flexibility for graphics; character fonts and the like are controlled entirely by

answer to E-series

The formation of Xerox Business Systems (CW, November 2) to handle all the firm's products that are not copier/duplicators means that responsibility for word processors such as the 800 and 850 has been taken away from what was the Office Systems division in Dallas, where development was going along very different lines from PARC and El Segundn. XBS also operates Xerox 7.718 shown here.

Computer Services, an nli-in bureau service that provides both computer time and programming for businesses, tocat government and the like, it has about 600 customers at present

vanced office systems and doing

pure research into the learning

process, and the like.

mens (CW, November 9) complement the company's innovative new offering at the bottom end of the 7.000 series, announced eartler this year (CW, June 1). This is Siemena' answer to iBM's still unennatinced E-scries and consists two models, the 7.708 and

The smaller model can be field upgraded to the larger, can be handled using 33 comand the processor is a new one, built in TTL technology. There arc separate input-output and Algot, PL/I and Basic.

THE formidable range of new computer offerings from Sie-

enhanced version of the BS2000 operating system, supporting screen-oriented trans action and interactive proces sing as well as tocal and remote Mastery of 10 commands is

enough to make use of the gystem, and most applications mands. Languages available include RPG, Coboi, Fortran,

Telecommunications in the US. The Zilog Z80 based 9100 converts data in IBM's Binary Synchronous Communication

Packet net

PACKET network operation

will be possible for IBM 3270

Network Interface Processors

developed by Cambridge

for 3270

users

format from a 3271 controller Into an HDLC format bit stream for tranamiasion over an X25 packet network to an IBM mainframe with a 370X frontend processor running Cambridge'a DMEP software. The 9100 series consists of two

mudela. The 9101 takes input from up to four BSC linas and outputa one X25 compatible data stream at up to 9,600 bps. It costs \$7,600. The 9102 inputs from up to 32 BSC lines, outputa up to four X25 compatible data atreams at up to 56K bpa and costs \$18,500. The DMEP software costs \$500.

First deliveries are scheduled for early next year, but Cumbridge does not as yet have a European agent.

Meet the Peterborough People



John Laing Construction are building Queensgale the new regional shopping centre in the heart of Peterborough. And I'm project manager. It's got tive department stores, 90 other shops. bus station and parking tor 2000

moved from Nollingham with my tamily and we're all pleased to be here. Peterborough's definitely here. Peterborough a becoming one of England's John Lockwood.

Find out about Peterborough now Ring John Case 0733-68931.

Peterborough

PO Box 3 Peterborough PEI tU]

NOVEMBER 27-29 c AD of digital electronic mo-vestence, symposium FIC Coor-Hilton Hotel, Brussels, Belgian NOVEMBER 28 computers in engineering etc. Computers in engineering etc. Long. William Elliote, Ken Res. Institution of Mechanical Engi-(Mochib., I lundrage Walk, London) The Larence Relocants neswork, P. J. F Kelly II-RL, London School of Hygiene & Tropcol Medicine, London We 1, 17 Ju An introduction to dataflow com on inconnection to dataflow com-pung, De P. Osmon, BCS South-West-leanth, Rowmon Horre, Wonford Hos-pud, Exelvi, 19.00 the role of large computer in latence Prof. Frank Summer BC5 >: branch West Clif Hotel, Westell Seut. 19 4%. Senantik coherence as the basts of innergoge of understanding. Dr Y. Wilks computation/Linguistics, fluive sity of Oxford. Dept of Experimental Psycho-logy, South Parks Read, Oxford, 17 00 Details: Mrs S. M. Hockey, tel. 0805-56721.

Punched tape reader family-120ch/s FACIT

letries are having the effect of exporting jobs, seconding to such as Equipment Trade Association. This is because raw metericia and have a property of the second and the second as and have a second as a second metericis and basic components are chorged a higher duty than lininad products, says BETA president Andy Andrewe in the association's annuel report. As an exemple, BETA cites misorated in the line of the line imported on their own from the US or Fer East, pey 17% duty. Assembled printed circuit beerds, on the other hend, pay 10% duty. This means it is chooper for Gillish firms to have their assemilish firms to have their essemto home oversees, comributing to home unemployment. The same applies to steel, the price of which is being held high under the Davignon Plan to project EEC producers, enceuraging times in places like South Kores than the products and us finished products, filing cabinets and the like, so haming our own menufacturers. And away added that a major Maidsjone Road Rochaelar, Kenil, Tellephone Medical

Success breeds success

Ours is a big name and we live up to it. Our business is growing all the lime, A substantial amount of our trade is repeat business and that only comes from ' performing up to standard. Success breeds success.

Communications is one of our specialities. Whatever 'communications' means to you there is a more than an even chance that we have aiready supplied systems to do it. We have users with simpla remote job entry terminals, we have customers using GEC 4000 computers to front-end data processing

machines, we have node processors, networks composed entirely of our hardware and networks mixing ours with others. We have multi-access and Iransaction operating systems and first hand experience of packet switching.

So'lf you are looking into the subject make stire that one of your first enmmunications is with us. Our UK Sales Manager is on 01-953 2030 ext. 3799 and our Export Manager is ext. 3478.

MICROPROCESSOR PRODUCTION PLANT

Edited by Martin Banks

straightforward and presents far the UK. fewer problems than other areas. This is because applicants csn more closely relate themselves to the European style of

However, Europeans usually work longer hours than we do in the UK. They atart earlier in tha morning and often finiah later in

employers regard the UK as a place to come to recruit labour at a lower rate than they would pay their own nationals. This is. something one should be wary about. Salaries indicating many thousands of francs per week can be very inisleading. The cost of living in Europe, as we ail

some places. tn Holland and, perhaps in Belgium you can work quite successfully just speaking English, although there Isn't any way you are looking for people who are going to achieve a senior posillon unless you learn the local isnguage. However, in France West Germany you will find it very difficult indeed to make progress without learning

I would suggest that when seeking employment snywhere in the world, you should check on the financial stability of your potential employer.

WORKING In Europe is fairly know, is certainly higher than in pect to come back every month "to see the famlly." The famlly Language is a problem in should be with you. Many employers would consider this a significant distraction if they felt their staff were constantly returning to the UK. They are

> committed to working for them In Europe and this should be borne in mind. Unfortunately, the British reputation for hard work has not always been obvious to Conlinental employers. They are be-

coming increasingly concerned about employing people from the UK. Whether this is justified or not I do not know. Perhaps one or two Isolated Incidents are



By John Goldsmill

Working abroad can oftan ba sn attracting proposition, but there are snage snd pitishe that can trap the unwary. John Goldsmith managing diractor of Goldsmith Recrultment International and chairman of the CSA's Recruitment Division, describae some of the problams ha has coma across snd some of the points that must be looked out for when very turing into foreign fields. Ha hae been involved in recruiting computar peopla for companies and projects in most European countries, the Middle East, Africa and tha US and Canada Tha latter areaa have baan tha biggest market so far, with Europe coming sacond, but Gold smith expacts the Middla East to offer consider arable opportunitias during tha next few year

land that the interest in ua as s computer nation has certainly waned. Again, one must not

believe that the opportunitles in Europe are very good and in years to come, the idea of going to live permanently in Belglum or in Holland, or in France, will not seem the colossal move that it perhaps appears today

One of the more interesting opportunitles now available li integration in every respect is the reasons for this thinking, but absolutely essential. Do not excertainly we have found in Hol-

ITHOLDS SO MUCH

Your crush-proof Flyte-Pak will

IT'S SO SECURE

Your goods are as safe

yourself, because Emery's

tight security system makes

as if you carried them

have their headquarters in Belglum, Frunce and Holland.

The Middle East is different In almost every facet, the local way of life is allen to what we are used to and so is the standard of living.

Do not go to the Middle East unless you have an opportunity to talk to the actual company you are going to work for. Many hings can be miaunderstood between agents and client and

if you feel that the leck of liquor, the often monestic existence that one hes to put up with in the Middle Eest is not ecceptable to you, then don't go.

ns an applicant, you cannot afford to get things wrong.

There are many things that von have to be sure of hefore you go there. One of the most Important, however, is that you will almost certainly need a

Many Middle Eastern com-Irles work six days n week, their "weckend" being on Thursday or Friday. A large number of the installations for which we have recruited only have Friday off.

It is also important to find out the quality of the necommodation one is going to he provided with. I know someone who recently went to Saudi Arabia and when he urrived in Ryndh. was put in a fint with eight other people. It took him sume time to nchieve a more acceptable

quality of living. Middle Ensiern haws are very different - and if you don't obey their hiws you will be in fromble. Therefore, if you feel that the bick of liquor, the often manustle existence that one has to put up with is not acceptable to you, then dun't go.

earn a lot of money that is tax people we have helped to free and it is a way of accumu-lating substantial funds.

Recently we have recruited applicants who have it is particular company in Kuwalt comes to mind, where they are comes to mind, where they are recruiting people in the UK on a career basis. They don't expect people to go out there to go out the feet are the fee people to go out there for six his employer and the They want people to go out there for a long period of time and commit themselves to wor-

and commit themselves to working in the Middle Eaat.

The career opportunity can be extremely challenging and one is not going to suffer in any way by baing out of the UK, as the hardware and systams being developed are in many cases more advanced than some of those here.

I beliave that during the next than the many cases was to give the next than the next than the many cases was to give the next than the many cases more advanced than some of those here.

nere.

I beliave that during the next then you are wasting you then you are wasting you months and years, we will see many more people going to certain parts of the Middle East for UK recruits the long periods.

The position of the female in locally

tain parts of the Middle East for long periods.

The position of the female in society there is very different. It is difficult to appraciate what this means unless one has actually been there.

The difference between, for example, Saudi Arabia and Kuwait is considerable. In Saudi Arabia a woman cannot drive her oar or go shopping on, her in Kuwaits.

own, etc, whereas in Kuwakis esn lead s fairly normal life.

Check carefully on the fits benefits available. You shak be offered at least one hold per year with free travel to the UK or some other place of we. choice. If you are not offernit. then I would suggest you so. .. be ill-advised to go.

Also check to see white Manufactured in Fairchild's there is any support from t. proprietary Isoplanor Integrated njection Logic, the 9440 hardware family consists primarily of home or flown to the Mills the microprocessor itself, and a East at companies' expense! single board system based on the Recruitment in North

device enlied Spark 16. Americs is, of course, diller. This is a stand-nione system One is usually emigrating to that comes with 4K words of probably wrong to talk at . memory, It has provision for a North America: we should :variety of firmware packages, including the Firebug debugging about Canada and then a. the US. They are two very parkage, Baby Basic, and two types of PROM Autoload. ferent places. mminent hardware additions

MICRO NEWS

set up a separate marketing and

support organisation for the

9440 family to cover the Nor-

hy Peter Turner. Similar organ-

Isations are being planned for the central and southern

include a range of support

circuits, such as the 9441

memory controller and the 94-12

Series of

seminars

MICHOPACCESSOR Osvelop

ment Systeme to the Itile of the first inco series of one-day semi-nate to be run by the National

Computing Centre. The aim to to provide information about de

valopments and mathods of application of micros.

Speakers at the first event, to

be held on November 30 at the NCC's Menchesiar head-

quarier, include Dr Mertin Hesisy trom University Cotlege, Cardiff, end Vincent Teeng from ICL Ostaskil. Cost of the semi-naria: 644

Future titles planned for the series include 16-bit micro-

processors, interfacing, and slorage technology. Further information can be obtained from the NCC at Oxford Road, Manchester M1 7ED.

European areas.

The quality of life in Card. very high. The cost of h." surprisingly, is probable: very much higher than is t. country and housing school However, again your Cr. empluyer is looking for-

Why should he reent. munth experienced st. the UK when he can findr Canada? He is looking for with significant technical perience uf some kind "

It would seem to me that majority of Canadian comppeople are more technical if the people in the UK. quality of interviewing Canadian companies is of av Bear in mind that in Canal:

you are not acceptable to employer, then you can be to They do not have the umployment protection web-

weeks' nutice would not be! The climate in Canada st nsual. However, you can usually arn a lot of money that is tax overseas have accepted this castly. I know very few el

Three manufacturers — A NEW showroom and office in Applied Data Communication, central Southampton was Micro V and Communication, central Southampton was tenis, necording to Panated.

over 50 sites, the firm is now prepared to market the system sald a spokesman.

minicomputer, and has aince become the subject of both auit and counter suit between the two companies, It is still, according to Longo, compatible with the Data General equipment. The £350,000 will be used to 1/O bus controller, and a two-

Fairchild puts £350,000

into UK marketing

of 9440 16-bit family

catled Flame 16. thern European area, which is tem uses Fairchild's nucrologic micro-programmed CPU, managed from the company's UK headquarters at Potters Bar memory control logic, memory purity logic, memory mapping logic and I/O bus converter

Memory capacity is 32K words, equally spilt between the two boards of the aystem, and this total can be quadrupled by replacing the 4K RAMs with -compatible 16K devices.

Next June should also see the Introduction of the 944S microprocessor. Also a 16-bit part, it will have a compatible instruction set to the 9440, and will add facilitles for on-chip hardware multiply and divide, extended addressing up to 64K words, a self-test capability, and stack manipulation, making it compatible with the Nova 3

Longo says that it should offer factor of four performance improvement over the 9440, uneraling at the same INMHz chek rate. He udded that this figure was in fuel likely to be greater, for the 9445 was being designed to operate at around

Both the Spark 16 and Flame 16 systems can be fitted into a packaged system called Focus 16. This is a chassis and front panel package Intended primarily for the OEM market. The FIRE software already

available includes such packages as Fireload. Fire dlagnostics and Firebug, and is complemented with both the baby Basic and a full business Basic. Several additions are in development including a floppy disc operating system, and compllers for both ANSI Fortran 77 and Pascal high leval languages. These compilers should be available

Multi-user Basic offer to micro system builders

SOFTWARE aupporting multi-user commercial Basic on major intel and Zilog microprocessors is being offered to micro system builders by Panatec Inc. a soft-ware house based in Oringa.

ware includes a Ilm sharing significant features.

operating system, an Extended Pana/Basic Is limic innguage processor, and a coniprehensive filo management successor and a licensed in the US for a flat fee of \$10,000 plus a royalty on each system. Althe software runs on equipment sold. the Intel 8080 and 8085, and the

already been licensed to incor-porate the software in their sya-

With a year's field testing at natinnwide and worldwide,"

it supports three file organ- directly.

wate house basad in Ort nge, tensive string handling capabilities, and Cobol-like facilities for Called Pana/Basic, the soft- data Item editing are further

Pana/Basic is typically

Zilng Z80, and is currently being Southampton store: Rdiapted for the Intel 8088.

licro V. and Sord - have opened last week by Xitan Sys-Tha company, which bas been

In business for over a year, is no authorised dealer for both Com-modore, with the Pat system, and Comart, which is UK distributor for Cromamco, Sol and Targeted at commercial applications. Pana/Basic is notable play in the shop, together with examples of the info 2000 floppy and charged of the info 2000 floppy. and character handling facilities.

character handling facilities.

character handling facilities, which Xitan is importing



board computer family based on the 8086, 16-bit microprocessor on the same bus. has been announced by Intel.

The board, known as the tSBC 86/12, follows the lead set by the other members of the system family by being compatible with the Intel Multibus. This, says the

the SBC ranga. company, provides the first supported by the tutellec Series execution and debug.

8-bit and 16-bit microcomputers to be introduced concurrent with the SBC 86/12 Is the iSBC Supporting a 1M byte address 957.

space, the new board can be This Is an interface and configured with the full range of execution package which perexpansion boards that make up mits software modules deve-With software development loaded to the SBC86/12 for full

the board are accommodated by an expansion of the Multibus structure to support 20 bits of nddress and 10 bits of data,

The memory capacity of the hoard includes 32K bytes of duat loped on an intellec to be down port dynamic rend/write for up to 10K bytes uf ROM.

Today's*

Yesterday's branch office



* And we mean loday's. The 745 is available Immadiately. Just fill in the coupon and send it now.

TEXAS INSTRUMENTS LA LIMITED European Digital Systems Division.
Dala Terminal Marketing, M\$33A
Manion Lane, Bedford MK417PA, Tel; 0234 67466 Telex; 82178

Slockport Tel: 061 442 8448 Slough Tel: 07.53 35545 Name __ Company Address



Branch office of the future, but available now that's the Model 745 Portable, from the "Silent 700" series of electronic data terminals. It gives representatives immediate access to computerised dats wherever there's a telephone and power point.

ust plug it in, link it to a 'phone handset and the 745 is resdy to send or receive up-to-the-minute data. You can then make instant decisions based on reliable, accurate information. In your customers' offices, for instance, the 745

can enter sales orders or print out complete reports in seconds on your stock, delivery times, prices or detailed

You can buy the 745 at attractive prices, or use our flexible leasing programme. And you can depend on responsive support from TI's national sales force with additional back-up from its distributor, T1 Supply, to handle small quantity immediate deliveries.

change ... lo greater efficiency and profit Learn more Call the nearest Tl office, or complete the pane

SILENT 700

The 745 means

The 745 Portable Data Terminsi adeniark of Texas Instru



worries and frustrations of

But now Emery Air Freight have put an end to your freight problems. They've introduced the flying briefcase. It's called the Flyte-Pak and is probably

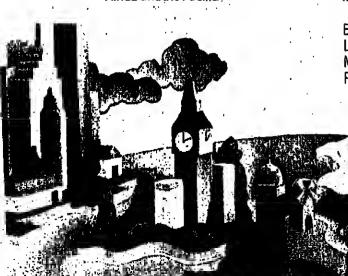
the most efficient and inexpensive way yet devised of sending small packages abroad. The Flyte-Pak is a tough, cardboard container that looks

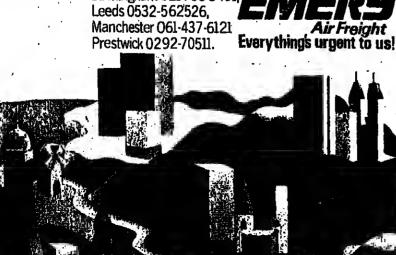
anywhere in the United States, or the Middle East, Africa and the Pacific.

just like a briefcase. Pack in your goods, stick on a label

and give a call to Emery. Your Flyte-Pak will be rushed on

to the next available flight for one of 22 cities in Europe,





Emery computer has your Flyte-Pak under

ANDIT COSTS SO LITTLE From airport to airport, the cost of the Flyte-Pak service is only £12 to Europe and the United States, or £15 to the rest of the world.

You see, Emery understand your sense of urgency. All you have to do now, is telephone Emery Air Freight and ask for your flying briefcase. The Emery Flyte Pak. It takes the frustration out of sending packages abroad.

Ring London (Ashford-Middx) 69-45921, Birmingham 021-706 6491; EMERU Leeds 0532-562526, EMERU Air Freight



经国际的政策和1000年代的政策的基础的基础。

First UK customer

handprint system

Widening gepe in the pay scales betthe computer industry recently spurred the Society of Civil and Public Servants into ection. It has put in e clsim for increesed computer staff

sllowsness - the second within 12 ween the private and public sectors of months. So far, the claim has not succeeded, but as Csmpbell Christie, deputy general eecretery of the SCPS expleins, his union is reedy to fight, ee he tells Robin Webster.

MAJOR government computer

In a bid to atem the eurrent flow of staff, the SCPS put in a claim (CW, September 28) claim aought to lift the scalea frain £150 after ane year's service, £300 after two years and

deputy general secretary of the SCPS explains, government pay restrictions have proved an insurmauntable barrier.

"The Civil Service Department has given us a negative response to the claim." he said. "and this is due to the present incames policy. We are naw seeking a senior level meeting with them at which we wil continue to press for these increases. There can be no cam-

'This latest claim has been lodged because we want to arrest the wastage of computer people from the Civil Service. mainly to the private sector.

"The drain eame about be-cause, since 1975, Civil Service pay has been negotiated rigidly within the government's guidelines, so we have had exactly what is ailowable. Obviously, this hasn't been the position within the computer industry in general - they have found

MAJOR government computer projects, both operational and under development, are faced with the threat of being run dawn or indefinitely shelved if scenarios being discussed within the Saciety of Civil and Public Servants about the effects of trained Civil Service camputer personnel leaving to work in the private sector became a reality. See This sector the cutfor increased allowances for the 8,000 programmers, systems analysts and operations supervisors it represents. The

vice, £300 after two years and £800 after three years, to £250, £500 and £1,000 respectively.

But as Campbell Christie, deputy general secretary of the

for various posts.

"The result is that Civil Service pay rates are nat competitive. They are not compelitive generally, and they are not campetitive in the computer area. It is brought to a head more dramatically in the computer urea of the Civil Service because these people have n skill that is immediately marketable autside."

Hawever, despite the guidelines, the SCPS has made many efforts to win better wages far its members.
"We didn't think govern-

ment policles were a way to resalve the country's ecanamic problems," said Christie, "but as part of the TUC we were duty bound to go along with the agreement that there was for a time between the TUC and the government. When the TUC broke away from the

campaign for a proper pay settlement and in support of this we tank strike action last Navember. We were not successful, sa we were forced ta aettle, because everybody else was settling, for a Stage 3 increase only. Even with that, we were beginning to recognise that our camputer staff rates were particularly out of line, so we ladged a claim at the beginning of this year asking that their allawances be improved. We didn't specify

the amount of improvement we wanted." Extra maney was awarded but anly in the form of the third level of £600 which was added to the then two-level allowance structure of £150

"in fact, others in the Civil Service had to have a bit less in order to provide for that." sald

Christie. "There was about 0.5% of the wages bill available for consolidation and additional things and although this did ga partly to computer staff, we then sald that it was ,not adequate to arrest the decline in trained computer staff that we were experiencing."

Actual wastage levels recorded by the SCPS and CSD show that turnover is "The two sources show that wastage has grown so much

that in the last figures that we have, far the quarter ending June this year, the wastage With the growth of demand in com-

puting generally in the Civil Service, the Civil So. the prospects are rate for programmers and sys-

enis analysts was running raughly at an annual rate of 0%. That dropped a bit in August, but the indication rom our branches is that it is picking up again and necelerating. So the prospect is that if It accelerates through this winter and into spring, we will have to run an through to the winter of 1980 bafare anything can be done due to the rigid application of incomes policy limiting us to a 5% increase. With the grawth of damand in computing generally in the Civil Service, he prospects are ingrendous.

The potential seriousness of he sltuation can be highghted by the fact that many f the 8,000 SCPS computer staff are deployed in essential areas within the Miniatry of

"The Civil Sarvice la the biggest single employer at nputer staff in the country, and the Ministry of Defence is the biggest of the departmenta employing data processing ataff. So the effect of ataff laaas is significant on the MoD," axplained Christle.

Apart from unclassiflad work like the processing of pay data for the armed forces, were any classified projects at risk?

There are people working on projecta easentlai to the defenca of this country, replied Chriatle. "But that Is only one element of it . . . the growing additional elament is that the whole range of government departments that use computers la at risk. The

Weish order

AGAINST competition from ICL, Data General and Olivetti, Burrougha is to supply a 128K. BI825 processor to Montgomery. District Council, Powya. The system will have 130 Mbytas of disc storage, two in-house Bur-roughs TD 831 terminals and two others, a TD 511 and AP 320,... at remote locations



CHRISTIE . . . "we want to arrest the westage of computer pasple from the Civil Service."

Inland Revenue department

for example is developing two

major computer projects: one

which is due to ga live fairly soon is the collection of all tux;

and the other, still in its early

stages, is the computerisation

of PAYE. But perhaps more

immediately significant is

keeping mounted projects that

ore now running. The develop-

ment of computer systems for

the payment of pensions and

child benefits are two expan-

ding areas that moy run into

difficulty if we can't keep up

the required level of mainte-

nance.
"The nonsense is that the

people who have to run these

and other government projects

are having to do so with their hands tied behind their backs

because the staff they trnin.

when trained, don't find Civil

Service pay attractive because it is artificially held back, and

so they leave. That puts pro-

the situation was that "We are

fixed with the classic dilemma

of Civil Service management,

those who have to deliver ser-

vices to the public, saying that

we should do something about

this, while the managers of the

country's economy, who are also in the Civil Service, are

snying that we need to have an

incomes policy and as govern-

ment we must enforce that

policy absolutely."

The further complication to

jects at risk."

Sweeping up debit

White Horse.

NEWS IN BRIEF

Gouncils sign

with Datasaa

CONTRACTS for Dalassei financial terminal equipment worth £225,000, have been

signed by five local authorite.
The largest is with the Selico

Metropolitan District Council

which has ardered four DS/S

processors, each with half a

Mhyte of disc atorage, 14 custing workstations and five rement

terminal adaptors.
Each of Sefton's D6/201 w

be cannected to an ICL 19037 g

payments against any fund type.
The other four authorities to

Sedgefield District Council

Chester City Council, Adur Ob

trict Council and the Valed

A COMPUTERISED Instained debt control service develope by Management Computing Services specifically for mix furniture autlets, and nos i operated by Centre-file, is being ! used by furniture and copa retailers, D.B. Furnishen d Pontefract. The system provide retailers with a weekly list of ! accounts, Including arrein uccount atatus, action to be : taken on bad payers, and n analysis of arreers levels.

Switch to software INVESTMENT in compart

research and development Haneyweil is running state nual rate of \$200 million, acces ing to chalrman and the executive Edson Spencer P. emphasis is awitching tost software and minicomp tems, an area in which to well is doing particular,1 Further acquisitions are plant where they would fill gaps: Hnneyweii's technology, acc. ding to Spencer.

Provident 'first'

ONE of the first UK Installations to use NCR's Virtual Resource Executive operating system is the Provident Mutual Life Association, which has replaced Its NCR 201 with an NCR V857 system to handle the expansion it its insurance business. The new system valued at 612,00 conslats of a 640K processe with 1.2 Mbytes of disc storige. and a 3,000 ipm printer.

CASTELL Management and Financial Consultant In information Technology

> VENTURE CAPITAL EQUITY FINANCE

ODES YOUR COMPANY REQUIRE DEVELOPMENT FINANCE? ARE YOU A PROPRIETOR WISHING TO REALISE CAPITAL? OO YOU NEED FUNOS TO OBTAIN OR RETAIN CONTROL?

My clianta have risk capital available in amounts of \$500,000 to acund and wall-managed companies with cities and wall-managed companies with the companies of the companies with the companies of the companies o managamant, or rasilaa cash.

Capital is provided by authorised sale of the or assured by or both capital is provided by authorised sale of few of sale aquity, or both, on an Over-The-Counter Market best sale of long-term risk capital and a private floiation few of the usual disadvantages of salling aquity I am aaaking New Tachnology-besad Firma who can

atrata provan: -producta or aarvicaa, capabla of future develop -managemant and continuing tachnical awareness -markat, continuing markat awaranass and new

potantial. Call me. Dr. Stephen Cestell on 0821-891776. 07 William

CASTELL COMPUTER & SYSTEMS TELECOMMUNICATIONS LTD c/o Box No. 1998

LETTERS TO THE EDITOR

'Fallacious reasons' why Basic for AlphaNumeric is popular on small systems

sons (CW. October 26) why Basic is popular on small systems. While accepting that the reasons stated are in agreement with popular wisdom, I feel that they are largely fallaciaus, depending in part on the common fallure to distinguish between Boatle tawn hall and applications will include rent and many bank updating, issuing one receipts and the recording of the Basic language and the operating system in which it is generally embedded. To conder the reasons in detnil.

IN a letter hended "Why IBM

presumes ton much" (CW.

October 26), Professor Barron

discusses the statement in the

IBM advertisement, "No com-

puter will ever be able to take

decisions based on Intuition".

Even a professor would be bold

ia proclaiming his certainty that

such a statement was false, and

Professor Burron la prudent. But

there is a strong implication that

he believes computers will one

Oneasks whether the basis for

this belief is a careful study of

the inherent limitations of pra-

grammability; or is it rather an

optinism, an unwillingness to

accept any limitations on the

functions that computers can

is imprudent enough to risk an

analysis of human Intuition.

"Presumably there la an elaba-

rate placess of associative

For what it may be worth, I

sing Management was hoppy that Bernard Allen in Op Spot CW, October 26), should pick

up our changes which will allow

operations staff with appra-

priate experience to join our

professional ranks. However, I

fear our intentions may not be

clearly understood as instanced

by Bernard when he writes that

night in the computer room en-

gronment are left out" and that IDPM should start by talking to

operators about the problema

they face in relation to training,

shill work and career progres-

be only to the same extent that

with less than a required level of

experience will be left out. No

one has suggested to us that we

should lower our entry require-

ments and allow anybody to

fact, we have just raised the .

entry requirements, not to make

ourselves more exclusive, but in

offer to be representative of the

skills now present in the in-

dustry.

What we have done is to say

accept operator experience

when evaluating an applicant. An applicant with two years as

If operators are left out it will

elaminers and even analysis

the people who work day and

Elther way, Professor Barron

technological

the not tell me that my intuition detect", "I have retrieved"

It's up to operators

THE Institute of Data Praces- an operator, then two years as a

day intuit.

(intuitive)

A computer's 'intuition'

pilers do exist; in passing, It would be desirable to keep production programs in compiled form. Similarly any other language can be interpreted, sa Basic's alleged advantage in being interpreted is largely a reflection of the software that hardware

2. Basic has some vary un-English-iike featuras willch I. It is true that Basic is hinder comprehensian. It is the

ment seema dangerously close

to the reductionist one that in-

rultion is nothing but an elabo-rate process of associative

searching - from which we can

be invited to canclude that the

advent of large-scale associative

storage will enable ua ta almu-

Barron presume toa much?

late intuition. Doea Professor

He proposes a Turing-like

test; if a decision has been made

by a computer, and if a human

being cannot tell whether the

decision was made by a com-

outer or by a human being using

intultion, then the computer can

be said to have used intuition. To

me, this variation on Turing's

test is even less convincing than

Suppose Prifessor Barran pro-

grammed his computer to prefix

all its outputs with a statement

ahnut the class of process it had

employed in their production. One could rendily necept

messages starting for example)

"I have enniputed", "I infer", "I

programmer, then one year as

an analyst will get appropriate

credit for the aperating ex-

perience. The value placed on

the credit will be different !

gained on a large 370 as distinct from a smail System 3. Should

the applicant have stayed in

operations and reached a pasi-

tian of responsibility, then our

evaluation based on years and

months x type of experience may qualify for direct entry to a

I believe that IDPM haa

already demonstrated its wish to

talk to operatora as witnessed by

a recent meeting of our Central London branch, held in con-

Weekly, especially for operators. It was standing room only. But

surely what we must do is not

just talk to operators. We have

to arrange a constant dialogue

We can provide the opportu

itles. We have a very real inter-

est in the problems of the opera

tars. We are especially inter-

ested in their career progression

But in order to do something

about these things, the opera-

EDWARD G. CLUFF,

Secretary Genaral

tors have to come forward.

between operators and DPMs.

professional grade.

May I propose a counter-test?

producers have provided.

know where we have to write T Instead of TOTAL, and it forces some peculiar constructiona. I would be very surprised to hear my wife say "If it is not raining, out of shape, should they propienore my next statement. erly be called Basic? How far Remember yaur umbrella". Yet this is the structurel equivalent

80 IF X>=0 THEN 100 90 LET X=-X

are fully interactive in the way described by Dr Stevens, others are not. Also debugging facilities of this type can be, and are. provided for other languages - eg Mantis on DECIO. There are tian works like that. The state- What possible programming languages such as Jass and its derivatives, and also APL and the statement "I intuit"? By the way, both Professor Barron and IBM might like to POP2, which are Inherently fully Interactive. This, however, is not tell me in what sense computers a consequence of the design of may be said to take decisions.

J. A. T. MADDISON **COLIN TULLY** Thaines Polytechnic, Landan SE18 York University

able control structures. However, apart from the general problems of stretching a design would the language have to change to be called Algol?

There would also be no bar to providing Basic-like editing facilities for other languages.

Previously, only high-quality 3. While some Basic systems

using handprinted characters as a vehicle for data entry via epitical character reading systems, 8candata, the OCR systems manufecturer, hes efficially announced its AlphaNumeric handprint system in the UK. By-passing the delnys sasciated with online cerrection of rejected cheracters, the system fastures an effline Scanplex 1 VDU that allews such characters te be atored and corrected while It has also announced that Its the source documents are etil

first customer in the UK is Lloyd's being scennad.

A typical eystem featuring e 32K 2250/1 OCR eystem with e 10ms, and that further systems are to go to the Netional Westminster and Midland Banks. Linkad with the launch of

printed numeric characters, with a few epoclel letters, were usable with OCR ecanning systems, but by using a flying epot scenner that separates "read" cherecters into 1,280 video alaments, the Seendate system can hendia numbers

Linkad with the launch of AlphaNumeric handprint, Scendata-hee opesed its daments at the new than the open and the cummine Keyscen Mixed-Madis OCR ayatem have been installed

White House installs hotel system

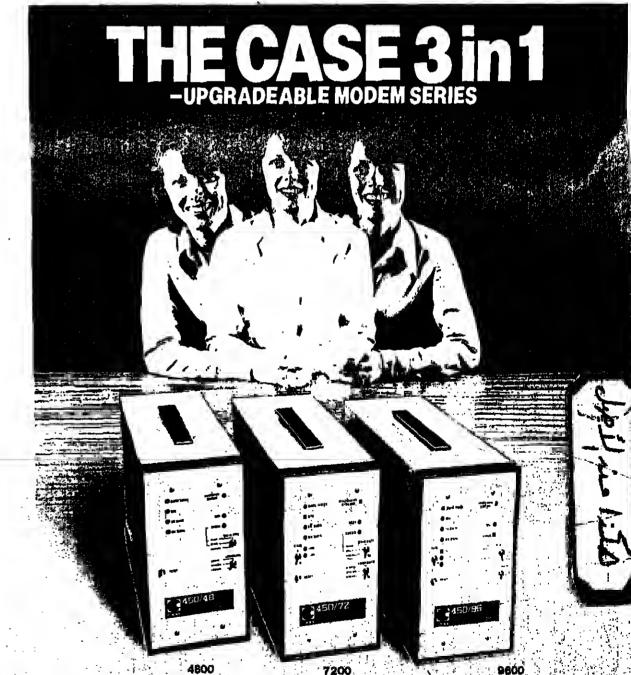
FOLLOWING the Landon Penta hotel (CW, July 6), the 600-room White Hause Hotel in Landan, owned by Rank Hotels, is to install the Computerised Hatel Accounting and Management Processing System from Marcol Computer Services. Bosed on a twin Data General Eclipse S130 system, the Champs system handles all reservation and accounting applications.

INFOTECH **STATE OF THE ART REPORTS** "The anily independent publishing project devated axclusively to a regular exhaustive analysis all the state all the art in computing" Sfluctured Analysis and Design Futura Natworks System Reliability and Integrity Future Programming inis Versus Mainliame Data Base Tachnology Micracoin puter Systams Individual Reports available at \$225 (£120) Special subscription price for all eight Reports \$1275 (£690) Please send ma your trea 28 page prospectus -----

Return to Infotech International Limited.

England Telephone (0628) 35931 Telex 847319

Vicholson House, Maldenhead, Berkshire SL6 1LD.



LSI design

COMPUTER AND SYSTEMS
ENGINEERING LIMITED
Woodpock Hill Estata Harefield Road
Rickmansworth Herts WO3 1PL England
Telephone Rickmansworth 76699
DAS B Telex 923325

Bureau service dropped • From front page

and Midas. Mator Industry Dealers' Accounting System. IBM says that these packagas are no longer being developed but that all commitments with respect to them made to cuaomers before July 31 when IBM stopped actively seiling that packages will be hanoured. That

program mainteoance. RBP is run on a 370/168 a IBM'a new bureau centra In Warwick, along with IBM's RJE and TSO services, The latter two are both still being actively marketed. The other machine a Warwick, a 370/158; rupa Tarminal Business System, TBS, for transaction processing and

itments caver areas like reporting.

 Speed upgradeable. Please send me more details about the CASE: Automatic equalisation Outstanding diel-up performance.

I LANGE	IO COL	i doi to			100	/** 3°4 '**	10.00
Name	<i>k</i>		E/L	<u> </u>	1933	and the contract of	1 ¹ 1, 21 4 ² 4, 17
Position						1.0	<u> </u>
Comp		1. 1.	19.04			of the co	
Addre	5 S	y	ا بازد در		4-4		" <u> </u>
10.194	Spain (C)	1 6 3 7	1.3	.د: ۱۲۰	£ 149.14	11	
	4	A THE STREET	-76		۸.	-74 B 3.1	A 10 10 10 10 10 10 10 10 10 10 10 10 10

Participative systems design

Involve all staff in the diagnosis of their own efficiency

PARTICIPATIVE systems de-sign means giving the user a the choice of final system solumajor part to pley in the dealgn tion. of his own computer system end of the network of roles, iysts are also members of the relationships and tasks that surround the technical systam.

When a new computer system is being introduced into a clerical or shop floor department the approach used by the authors is to create a design group consiating of represente tives of ail staff in the department in the tema menagement and senior

design group and their role is to give advice on how the computer can assist the achievement of efficiency and job satisfaction objectives, and to design the technical part of the system when this is agreed.

in addition to the deaign group, a steering group of senior user management, senior ayadiagnosis of their own efficiency trede union officials is also

provide the design group with top management and union sanction and assistance, and to act as advisers if the design group becomes anxious that a particular system solution may not be in line with company

This approach may sound dif-ficult or even impossible. The authors have now been eble to use it in six different kinds of organisation end the results have been excallent — good computer systems, liked by the

staff who use them and associated with well designed The role of this group is to jobs which provide interest and

> The firat task for a design group of this kind is to take responsibility for making an accurate diegnosis of user needs. These will include present job aatisfaction and efficiency needs, and an assessment of fu-

> ture needs and priorities. With participative systems design an increase in job satisfaction is always a system objective. Because the design group has no experience of

faction" analysis; and 3. A method for Identifying significant opportunities and development goals -- "future

department as diagnosticians,

the authors have developed a

number of simple tools that can

be taught without difficulty to

design groups and their depart-

. A method for identifying

"variance anelysis" be-

efficiency needs and problems —

cause it focuses on weaknesses

in the existing system;
2. A method for identifying job

satisfaction needs — "job satis-

mental colleagues.

VARIANCE ANALYSIS consists of identifying all the weak links in the way the tasks of a deportment are carried out prior to the change. This includes aspects of work where coordination is difficult, and where errors either occur frequently or occur infrequently but are difficult and expensive to correct.

All staff in a department arc usually expert in these problem areas. They have been trying to get something done about them for years. They can all be in-voived in documenting the nature of each problem, where It originates, where it shows up. where and how it is controlled and in suggesting how it could be avoided or more effectively controlled in the future, assisted

by the new computer system. JOB SATISFACTION is defined as the "fit" between what an individual or group is seeking from the work situation and what they are receiving from it. This is something that con he

measured provided job satisfactives as a preliminary to system to design. How objective at and benefits assessed with tion cun be successfully defined. The outhors aec it as being nchieved when five sets of needs are met in the work situation. These are knnwledge needs, psychological needs, efficiency needs, task methods and ethical needs. The following kinds of

f used participative sylends sign the kinds of variants have been identified high questions which are aaked through questionnaires and small group discussions will help identify these needs: 1. Knowledge needs - to what extent does the existing organisation of work meet employee needs for work that

their skills and knowledge;
2. Psychological needs — to what extent does the existing organisation of work meet the needs of the employee for responsibility, a sanse of achievement, status end recognition;

fully uses, and helps develop,

3. Efficiency needs - to what want work that warlety, ohallenge opportunity to use di and devalop the rough The creation of jobs in the creation of the creation of jobs in the creation of jobs in the creation of the creation of jobs in the creation of jobs in the creation of the creation of jobs in the creation of jobs in the creation of the creation of jobs in the crea extent does the work situation provide employees with the support services and control system that assist their efficiency;

4. Task needs — to what extent does the way in which work

doing this kind of analysis, and is organised and jobs and the intention is to use the whole

The design group diese.

the answers to these ques

with all staff in the depart.

in small groups and thec.

are identified.

important job satisfaction

FUTURE ANALIE

ottempts to identify the net.

the department in the future

he subjected to major du Change may be a result div

the extent to which it is list.

demands from customer.

technical possibilities,

management or tres

attitudes, new legislation

In order to design a se

which will meet the net24.

future ns well as of the pac

design group has to (1)."

occur over the expected.".

of the system; and (b) ...

now flexible the syster:

he to accommodate to important of these charg-

Because change can c

time horizon, the plus

horizon for the new system

ile within this forecis

These three technique

variance analysis, job sub

tion analysis and future and provide the design group dingnostic information at enubles it to set human if

istrntive and technical

discussed in our next copy

very different, but their lo

The most vulnerable

aystem are usually at itsut boundary, where it is its

with the outside work

lasser extent, between

if greater control ca

in the same way, job

tiona. Most em

many other fectors.

Part 2—By Frank Land

The failure of systems designers to include the views of a usere in their design specifications were e feature of a RC survey of DP user requirements. In an effort to evaluate this type of criticism, o technique of participative systems to be a proposed by three specialists in comments.

dasign has been crooted by three specialists in computer and systems managament: Enid Mumford, of the Man and systams managaman. Line transition, or the Man-chastar Business School; Frank Lond, sanlor lecture 1

computars and ayatame enalysis at the London School of Economics; end John Hawgood, director of the computer

aboratory at Durhom University. Thair technique het non

baan implemented at a number of user sites, and in a

specially commissionad saries of five articles, Municipal Land and Hawgood will describe their methods, drawing on their implamantation experiences of the technique.

The first article, last week, was by Enid Mumford. De

waak Frank Land (picturad laft) writes on dealgrigroups and

signed meet employee needs: were formed towards the end of the Sixties, nt a time when a 5. Ethical needs - to 12 number of doctors, scientists, extent does managements. employees in the way they by ourses and administrators and computer professionals had bethey should be treated pera gun to see some of the possibillarly in respect of commutaities opened by computers in the health care environment. ment in decision taking?

A number of teaching hosphals had installed small batch processing computers and were exploring their value, regional pepital boards were using small batch processing computers for their financial systems and the Ministry of Health had initiated ils experimental computer programme to explore real time computer systems in health

of the British Computer Society

Although there have been many surprises along the way, many of the things discussed and proposed at that time are now operational in a few centres, and the challenge of the present is that of spreading the henefits of the few prototype wstems across the Health Serrice as production model sys-

The Medical Specialist Groups ran two national conferences in Binningham (1969) and Bristol groups based in Scotland, Nor-thern England (Manchester) Security.

Each group operates differently, according to its geo-graphy and membership. The Scottish group prefers one-day meetings, the Northern group arranges ad hoe meetings and the Southern group has a programme of evening, half-day and one-day meetings. The total mailing list is about 800, many of BCS, but are interested doctors, nurses, administrators and scientists who pay a nominal fee

nnd Southern England (Lon-

BCS SPECIALIST GROUPS — LIVING WITH COMPUTING

The British Computer Society's apeciallat groupe are organising a conference in London from January 4 to 6, celled BCS 79, Living With Computing. In this series of articles, the

work of the specialist groups and their BCS 79 plane are described. This week the focus

la on the medical groups in en erticle by the groupa' chalrman, Dr Berry Barber.

Power and potential

medical profession

of computers in

One of the major objectives of the groups is the mutual education of computer and health care professionals in the power and potential of computer systems already available from Springer and developing guidelines for Verlag (58 DM) or direct from good practice in their myself implementation. The groups provide an open forum for discussium of the multitude of ments are interesting. One is the related matters concerned with computer system design and implementation from technical aspects of computer hardware, care field, operating systems and databases to the system aspects of

user education, privacy and

computing committee of IFIP(TC4) and were n founding member of the European Federation fur Medical Infor-So far the higgest enterprise of the Medicol Specialist Groups was the running of the first

Federation Congress, Medical Informatics Europe MIE 78, in Cambridge this September, Over whom are not members of the 420 delegates attended a very successful meeting. The opening speakers were Professor Maurice Wilkes and Sir Donglas Black, president of the Royal College of Physicians, David Ennals, Secretary of State for the Social Services, spoke at the dinner and the proceedings are As well as the more specific

changes, two general developgrenter involvement of the nursing profession in the development of computing in the health

The second major development is the increasing aware-

ness that the various manage

ment services disciplines The Specialist Groups have represent facets of a single specifically non-English word used by few British computer professionals but by most in ternational English speaking cumputer professionals, embraces all aspects of this

> To launch these activities, the Medical Specialist Groups of the BCS set up a UK co-ordinating committee to provide a national view for meetings of the Council of the European Federation for Medical Informatics and to promote and co-ordinate national BCS 79 will provide an oppor-timity to see some aspects of

medical computing within the context of the other BCS specialist groups Officers of the BCS Medical

Specialist Groups will be glad to provide information on their ictivitles, the work of the planning for Medical Infor inntics Berlin which is due to be held in Berlin from September 17 to 20, 1070. They may be con facted through the BCS.

Valuable survey of

computer companies operating in UK

A SURVEY of computer companies House, and UK subpanies operating in the UK sidiaries of companies head-quartered in Continental Europe Company Comparisons. Called Computer Data Processing loss-makers, underlining how Equipment', it is the fruit of a diligent search through the files of 174 companies at Companies blished in. House, and consists of company name, and two years' turnover, assets, liabilities, before-tax the companies listed in the aur-

those to the end of 1976.

The most noteworthy point brought out is that it is by no at the back of the report. means easy to make money in the UK computer market. Of the 174 companies llated, 53 reported a loss in the last year for which they lodged figures at 185 cm Mrs Hert at Inter Company Comparisons Ltd, 81 City Road, London ECIY IBD. Telephone 01-253 9736.

Since the data is all historic, it would be unfair to name any of

rofit and payments to directors. vey. There are not many obvious The usefulness of the survey is omissions, although two to some extent limited by the fact that the most recent figures for most of the companies are Companies which heve not submitted accounts since 1974 or 1975 are excluded, but are liated

Butlin's orders Nova

Transaction Processing System quick implementation, software from DCC international, n devision of the Data Communications Corporation of Memphis, Teunessee,

One system will be installed at eoch of the eight Butlin's hollday centres in the UK and will enable staff to respond within 24 about occommodation and

luce more management statistics and reports.

nicknamed Octobus, has been is £2,450.

TO help speed its booking proc- designed and developed by Rank customers, Butlin's has placed a a screen formutter, Cobol pro-£400,000 order for eight Data gramming longuage, and an General Nova 3 systems, with automatic job scheduler for

A RANGE of iBM-compatible Hoppy disc subsystems lins been introduced to the UK by Memec Systems. The FTO500 aerles is supplied without drives, or with hours to customer inquiries either one or two drives. The system is software programmable for single or double density and can, if required, be uce more management statis-es and reports.

The reservations system.

icknowled Octobre has been a capacity of 2.5 Megnbytes.

Price of a basic twn-drive system.

BM370 and 303X users...

Here's your through-ticket to MVS

MVS is tomorrow's direction. That's the IBM line. It's great to arrive but it can be a fearsome journey if you travel alone. We should know. We were first in Europe.
Since Datasolve came to MVS four years ago we've been the

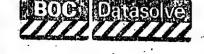
navigators for dozens of other companies who wanted to travel

Helping them gain MVS experience on our large IBM and Amdahl computers before letting them strike off on their own. Allowing them to build up MVS momentum to a point where their own operation could take over.

Giving them expert technical assistance, comprehensive MVS training and the benefit of our special MVS services like TSO3, the interactive program development aid to conversion.

Datasolve will help you plan and administer your MVS itinerary

with the understanding, experience and cost-effectiveness that only Britain's most seasoned MVS travellers can provide. Whatever your route to MVS, Datasolve is just the ticket.



BOC Datasolve Limited

Datasolve House 99 Staines Road West Sunbury-on-Thames Middlesex Telephone: Sunbury 85566

Lecture **50th Faraday** THE first presentations of the 50th Faraday Lecture of the Institution of Electrical Engineers were given in Swansea earlier

this month.

Entitled The Diagnostic Electron, the lecture is an overview of the use of electronics in medical diagnosis: It was written by a team of six specialists from EMI, who will take turns.

MORE AND MORE COMPUTER PEOPLE ARE TAKING THEIR WORK HOME WITH THEM.

Des. Res. with all Mod. Cons. could soon include a Home Computer,

Read about 'ComputerLib' in OMNI. You can buy o domestic computer for as little as £300. But did the computer Industry prepare for drostic change as the price of computers fell? Did ony big componies get ready for this change? You bet they didn't.

Bionic Inflation: The Eight Million Dollar Man. Read 'The Reol Bionic Man' in OMNI. The University of Utoh has already gone one step beyond the Six Million Dollar Man.

They've just spent over eight million dollars on bio-engineering. And ochieved some remorkable

The Future Shock author asks: Are we living in the future now?

Read the Alvin Toffler Interview in OMNI. What kind of society ore we creating? A new society? Or merely on extended larger-thon-life version of our present society?

Toffler has other ideas.

Dolphin Talk - can we fathom it out? Read 'Communicating with Dolphins' in OMNI. Dolphins are known to make certain sounds in the presence of humans. And only in the presence of humans. Computers are now helping us to decode Dolphin talk into language we can understand.

If you were the last whale, you would sing a sad

Read 'Whale Song' by Leigh Kennedy in OMNI. The whale had felt the danger for weeks, tasting man-ness and potential death in the water

He'd colled ond called for others. This season he heard nothing. I am lost, I am alone.

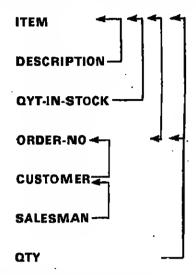


TOMORROW'S MAGAZINE TODAY.

RELATIONAL DATABASES

IN Part 3 a technique for constructing fourth normal form (FNF) files was presented. This week we will use the technique to construct FNF files from the brewery example given in Part I. The advantages of FNF filea will be discussed and we will go on to show how relationships between files can be represented

Relationship diagram. The relationship diagram for our brewery



From this diagram it can be seen that: ITEM is a direct key for DESCRIPTION and for QTY-IN-STOCK. ORDER-NO. Is a direct key for CUSTOMER. CUSTOMER Is a direct key for SALESMAN.

A concatenation of ITEM and ORDER-NO. is a direct key for

Application of the technique deacribed in Part 3 results in the following breakdown of the reistionahlp diagram into four FNF

ITEM **ORDER-NO** DESCRIPTION QTY OTY-IN-STOCK CUSTOMER ORDER-NO

The undarlined data items are prime keys; in the second file, ITEM and ORDER-NO together form a concatenated key. Figure 2 shows details of each of these files.

CUSTOMER

SALESMAN

The n-to-n relationship between ITEM and ORDER-NO does not result in a fifth file (which would be built in Step 4 of the process) because ITEM and ORDER-NO together form a conestensted key for OTY (and would thus be selected in Step 1).

Normsilsation. The conventional file shown in Figure 1, Psrt 1, could have been decomposed into the four FNF files in Figure 2 by a process different from that described in Part 3. This alternative process is called normalisation, and it consists of reducing the conventional file to first normal form, then to second normal form, to third norms! form and finally to fourth normal form.

The results of the two processes are the same and readers who have followed this series will have no trouble in understanding any of the standard texts on the subject.

A dissdvantage of normalisation is that a conventional file naeds to be designed before it is normalised. If the conventional file already exists, fine; if not, it must be designed. The relationship diagram method can be used on a collection of data items which have not yet been formed into files.

Advantages of Fourth Normal Form files. FNF files have several advantages over their conventional equivalents. These ndvnntages are illustrated by examples which compare the FNF files in Figure 2 with the conventional file in Figure 1, Part 1.



This is the fourth pines Wisk Stawart's series to dayalopment and the ralotionsi databata Rik panda on tha technique constructing fourth Must form file, FNF, and you to show how relations batwson file on the raprasented. Stewarth laionsi technical severiments of third validation of the control of t Vahiclas, the community

Addition. If a salesman finds a new customer, this customer identity cannot be added to the conventional file unity customer places nn order. It can, however, be sided to fig. Figure 2 tagether with the name of the sslesman.

Undate. If customer Spuman is allocated to snother salesming is necessary to update three occurrences within two render the conventional file but only one occurrence within one acin File d. If instead, salesman Joe is replaced, it is necessaring and in the convergence of the convergence file, but only one occurrence within one record in Filed

Deletion. If ITEM Sung ceuses to be stocked, all references CUSTOMER Fuddle and SALESMAN Jim vanish in the acc tionul file, but not in the set of FNF files. Note that Jimis Full. local salesman irrespective of what items Fuddle orders

Efficiency. FNF files have fixed length records (le no reprigroups). Fixed length records can be handled more efficient both hardware and software than can variable length mote: software can be simpler, and the packing density (on dischite higher. Note, however, that our aim up to now has been here a logically sound file structure which is implementation:

Euse of Use. FNF files can be represented by tables, coasts. files with repeuting groups cannot. Tables are readily units.

Are you legal, decen honest and truthful?

Advertisers have to b The Advertising Standards At

File c LEM ORDER-NO QTY. 12 20 6 1,000 500 20 10 30

By Max Stewart

There are no hidden and unsuspected relationships between data items in FNF files. Data items in a file, which do not form part of a candidate key are unrelated, unless there is a multiple relationship. This will be described later in this series.

Reistionahlps between Files. When files have been designed using the inter-item relationship diagram (the forms in sme for the type of relationship diagram used up to now), the inter-file relation-ship diagram can be drawn. This shows the relationship between the keys (which may be concstenated keys) of different files.

Another example of Inter-Item relationships is shown in this

Notas	ltam	Relationship
School roll no	PUPIL	4-14-14
Long taxt fiald	PUPIL-DETA	ILS-
Subject names ara unique	SUBJECT	4-4
Long tsxt fiald	SUBJECT-DE	TAILS-
Mark valua	MARK	
Examinsrno	EXAMINER	

One pupil does not sit the same subject twice, and an examiner may mark papers in several subjects. Examiners marking popular subjects may share the workload with other examiners. The corresponding FNF files are:

PUPIL-DETAILS SUBJECT SUBJECT-DETAILS PUPIL, SUEJECT MARK EXAMINER

where the prime keys for each file are underlined.

The corresponding Inter-file relationship diagrom is:

Notes	Kay	Raletionahip
Pupil file	PUPIL	4
Subject fila	SUEJECT	€
Msrk fila	PUPIL, SU	IEJECT-

The Pupil file is related to the Mark file on PUPIL (the school roll number), and the Subject file is related to the Mark file on SUBJECT (subject name).

Summary. Let us summarise what has been achieved so far. We have defined keys, dependency, candidate keys and FNF files; shown how to draw an inter-item relationship diagram; presented a technique for producing FNF files from this relationship diagram; and shown how to construct an Inter-file relationship

disgram.

Part 5 will discuss some aspects of implementing s system of

File e		
ITEM Keg	DESCRIPTION	QTY-IN-STOCK
Keg Bung Tep	Steel Breas	10,000 300

File b		
ORDER-NO 1 2 3 4 5 6 7	CUSTOMER Orotny Spumen Eversoft Crudgingten Fuddle Spuman Orotny	

	File d
CUSTOMER	SALESMAN
Grotny Spumen Eversoft Crudgington Fuddle	Jae Jack Jack Jack

DEC announces real time boost for VAX-11/780

Two of the new products, an improved semiconductor memory and the BLISS-32 high level systems implementation is nguaga, have already been snnounced in the US (CW, October 5).

The new memory uses 16K blt chips and or the whole system can be licensed for is available in increments of 256K, 512K and 1,024K bytes. Its use raises the msxlmum memory size from two to eight Megabytea. A one Megsbyte Increment now costs

First major

CONSUMER buying guidaa will

signed up its first major cus-

tomer for 400 psgea. The cus-

customer

HARDWARE and software enhancements for the VAX-11/780 have been announced ment of operating systems, compilers, second, and can be used either in single by DEC to below users with their real time. by DEC to help users with their real time scientific and process control spplications.

run-time system components, database user mode or for the control of up to eight systems, communications software and experiments simultaneously. The DR11-8

> It transistes source programs into relocatable object modules that can be linked The 8LISS compiler costs £12,000 to buy,

Two new direct memory access Interfaces have also been announced. The

The other new product la the TU45 tspe subsystem, which has a read/write apeed of 75 Inchea per second, data densities of either 800 or 1,600 bits per Inch, and a data transfer rate of 120,000 chps. The ninetrack sisve drive version of the subsystem

system is a 18-bit parallel interface for

spplicationa requiring higher data rates. The LPAI1-K costs £5,265 and the DRII-8,

LPA11-K system transfers data st an costs £9,923. Salespac debut at Compec exhibition

AN order processing, stock control, and accounting system designed for operation by inexform a substantial part of Baric's 8,000 page Prestel Information Provider service, and Baric has perienced users has been Introduced by Gsmms, and will have its first public showing at the Compec exhibition which begins on December 5 at Olympia.

Csiled Salespac, it is based on Digital Equipment hardware, tomer is Comet Radiovision Services, the electrical goods ilscount house. Saric will preand Gamms's first customer for pare the pages, updating some of the system is Konishiroku UK, hem weekly to show Comet's the Felthsm-based branch of Konico Comeras.

latest goods and prices. Comet will pay £10,000 for the The Konishlroku system uses first year to reoch Prestel sub-

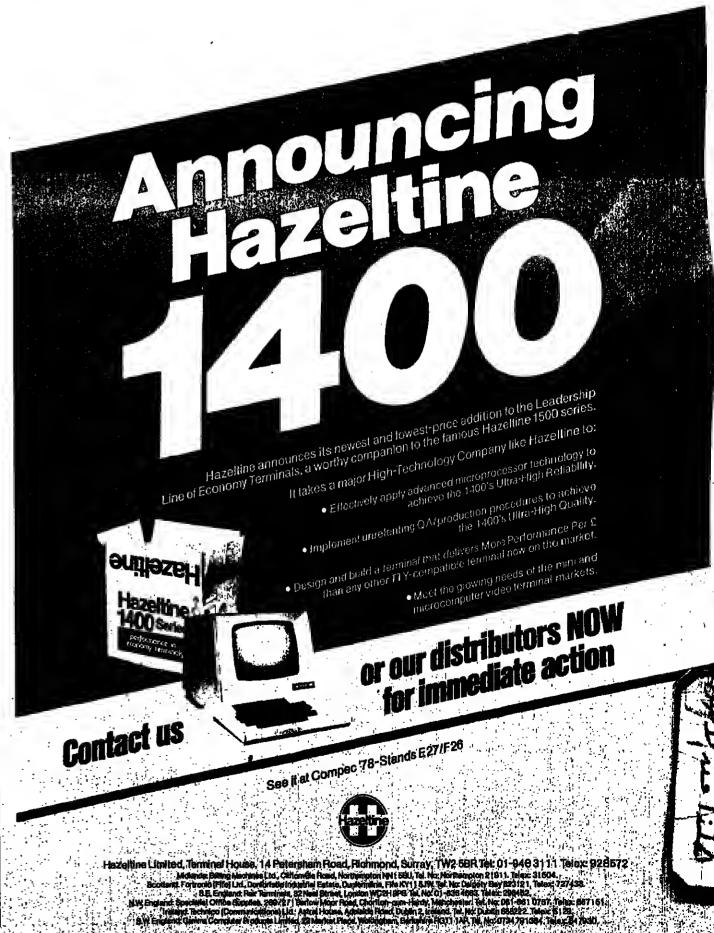
stock control, management and cost about £120,000. reporting and sales ledger appli-cotions. Talks are also taking Diboi and can be run under place with Gamms on the possibility of adding s word processing cspabllity for mslling purposes, snd purchase/ nominsi ledger and budget forecasting fucilities are to be provided Ister.

A typical small Salespnc sys-tem would consist of a DEC 320 processor, two VDUs and a line printer, and this would cost The Konishlroku system uses about £21,000, while a large system DEC Datasystem 354 to handle tem, based on a PDP-11/70, order entry, order processing, could support up to 32 VDUa

either the CTS 300 or CTS 500 operating systems, costs £5,000

200th Filetab sale

WITH an order from the Insursnce company, Equity and Lsw, the NCC hsa chalked up 200 oversees sales of its Filetab file maintenance and report generator package. Equity and Law will use the software at its Dutch HQ in The Hague.



Computer As (U.K.) Ltd. Park House, Park Street Maldenhead;

CA-DYNAM/D Disk space and catalog management system for DOS, DOS/VS users Like adding more disk drives ... for free!

By slashing disk spece needs ; seven different weys, some of our cliente celculete thet CA-DYNAM/D paid for itself in less then three months.

Here's how | One: CA-DYNAM/D ellocetes only es much spece es is actuelly needed ... end does it eutometicelly.

Two: it autometicelly releeses unused spece. Three: it allows ell partitions to share eny one work aree. Four: it limits fregmentation of diak volumes. <u>Five</u> ; it ellocatea eecondary apece. Six: it ellows sequential files to be deleted eutometicelly efter closing. Seven: the DYNVTOC displey end verious disk space utilisetion raports halp optimisa use of devices.

Up To 40% Disk Space Sevinge

Disk spaca sevings alone can easily run up es high as 40% in the everege IBM centre funning enywhere from four disk drivas on up.

Thet adds up to a lot of extre disk drive capecity you cen use to put off the dev whan you reelly need to edd mora drives.

We have a chart that shows you how much sevings ere required for CA-DYNAM/D to emortisa itself within a given period of time. After thet,

call me, I'm interested in knowing more shoul CA-DYNAM/D

Plus Other Benefite

benefits you realise with CA-DYNAM/D.

it'e pure profit!

Veluabla disk spece savings is only one of several other For example, you can count

on an immediate end measurebla increese in throughput. Aborted of bypassed jobs are ellmineted. Progremmer productivity goes up because there's no longer env need to mep disk file eddresses - or keep treck of file size or other ettributee. File security, too, is improved...

CA-DYNAM/D has a number of other features that help meke it the faeteet selling Disk Speca end Cetelog Menegement System sold todev.

It's eveileble to you entirely without obligation for a 30-dev triel_eveluation. Just cell us or send the coupon todey!

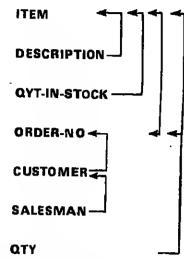
COMPUTER ASSOCIATES

David Tory,

RELATIONAL DATABASES

IN Part 3 a technique for constructing fourth normal form (FNF) files was presented. This week we will use the technique to construct FNF files from the brewery example given in Part I. The advantages of FNF files will be discussed and we will go on to show how relationships between filea can be represented

Relationship diagram. The relationship diagram for our brawery



Application of the techniqus described in Part 3 results in the following breakdown of the relationship diagram into four FNF

ITEM

ORDER-NO **OESCRIPTION**

QTY QTY-IN-STOCK

OROER-NO

CUSTOMER SALESMAN CUSTOMER

The underlined data items are prime keys; in the second file, ITEM and ORDER-NO together form a concatenated key. Figure 2 shows details of each of these files.

The n-to-n relationship between ITEM and ORDER-NO does not result in a fifth file (which would be built in Step 4 nf the process) because ITEM and ORDER-NO together form n concatenated key for QTY (and would thus be selected in Step I).

Normalisation. The conventional file shown in Figure 1, Part 1, could have been decomposed into the four FNF files in Figure 2 by a process different from that described in Part 3. This alternative process is called normalisation, and it consists of reducing the conventional file to first normal form, then to second normal form, to third normal form and finally to fourth normal form.

The results of the two processes are the same and readers who have followed this series will have no trouble in understanding any of the stendard texts on the subject.

A disadvantage of normalisation is that a convantional file needs to be designed before it is normalised. If the conventional file already exists, fine; if not, it must be designed. The relationship diagram method can be used on a collection of deta items which have not yet been formed into files.

Advantages of Fourth Normal Form files. FNF files have several advantages over their conventional equivalents. These advantagea are illustrated by examples which compare the FNF files in Figure 2 with the conventional file in Figure 1, Part 1.



This is the found page. Max Stawart's sent the day alopment and suf-ralational databases, the pands on the technique constructing found found form file, FNF, and song to show how releases between files one page to show how releases. batwaan filst cut raprasented, Stewenha.
Island tachnical Nym.
nanagar for Lybrid Vahiclas, the community

Addition, if u suicsninn finds a new customer, this customer, identity cannot be udded to the conventional file units customer pinces an urder. It can, huwever, be added to Fight Figure 2 together with the name of the salesman.

Update. If customer Spunran is allocated to another salana. is necessary to update three occurrences within two records: the conventinnul file but only one occurrence within one medi in File d. If Instead, sulesman Jue is replaced, it is necessary inpute two occurrences within two records in the convents. file, but only one occurrence within one record in Filed.

Deletion. If ITEM Bung ceases to he stocked all reference CUSTOMER Fuddle and SALESMAN Jim vanish in the cone tional file, but not in the set of FNF files. Note that Jimk Fulls local salesman irrespective of what items Fuddle orders.

Efficiency. FNF files have fixed length records (le oo reput; groups). Fixed length records con be handled more efficients both hardware and software than can variable length records software can be simpler, and the packing density (ondiscibile higher. Note, however, that our alm up to now has been toons a logically sound file structure which is implementation is

Ease of Use. FNF files can be represented by tables; convert files with repeating groups cannot. Tables are readly and asset

Are you legal, decent honest and

Advertisers have to The Advertising Standards

diagram. Part 5 will discuss some aspects of Implementing o systam of File e ITEM truthful? DESCRIPTION QTY-IN-STOCK Keg

-	File c	
ITEM	ORDER-NO	QTY.
Keg Keg	1	12
Keg	. 2	20
Bung	3	6
Bune	{ 4	1,000
Ten	6 2	600
Tan	2	20
I ap	Š	10
Тар	7 .	30 60

File d
SALESMAN
Joe Jack Jeek Jack Jim

By Max Stewart

There are no hidden and unsuspected relationships batwean data items in FNF files. Data items in a file which do not form part of a candidate key are unrelated, unless there is a multiple relationship. This will be described loter in this series.

Part 4

Relationships between Files. When files have been designed using the inter-item relationship diagram (the formal name for the type of relationship diagram used up to now), the inter-file relationship diagram can be drawn. This shows the relationship between the keys (which may be concatenated keys) of different files.

Another example of inter-item relationships is shown in this

Itam	Relationahip
PUPIL	47474
PUPIL-DETA	AILS-
SUBJECT	4
SUBJECT-D	ETAILS-
MARK	_
EXAMINER	
	PUPIL PUPIL-DETA SUBJECT SUBJECT-D MARK

One pupil does not ait the same subject twice, and an examiner may mark papers in several subjects. Examiners marking popular subjects may share the workload with other examiners. The corresponding FNF files nre:

PUPIL-DETAILS SUBJECT SUBJECT-DETAILS PUPIL, SUBJECT MARK EXAMINER

where the prime keys for each file ore underlined.

The corresponding Inter-file relationship diagram is:

Notes Pupil file	Key Reletionahi	P
Subject file	SUBJECT -	
Mark file	PUPIL, SUBJECT	

The Pupil file is related to the Mark file on PUPIL (the school roll number), and the Subject file is related to the Mark file on SUBJECT (subject name).

Summary. Let us summarise what has been achieved so far. We have defined keys, dependency, candidate keys and FNF files; shown how to draw an inter-item relationship diagram; presented a technique for producing FNF files from this relationship diagram; and shown how to construct un Inter-file relationship

Тар	Srass	10,000 300
	File	ь
OROER-NO 1 2 3 4 5 8 7	Gr Sp Ev Cr Fu 6 p	USTOMER otny within ersoft udgington ddle within

	File c	
ITEM	ORDER-NO	QTY.
Keg Keg Keg Bung Bung Tep Tap Tap	1 2 3 4 6 2 4 8 7	12 20 6 1,000 600 20 10 30
	Filed	

	File d
CUSTOMER	SALESMAN
Grotny Spuman Eversoft	Joe Jack
Crudgington Fuddle	Jack Jack Jim
Figure 2	The first of the second of the

DEC announces real time boost for VAX-11/780

scientific and process control applications. Two of the new products, an improved utilities. semiconductor memory and the aLISS-32 high level systems implementation langu- locatable object modules that can be linked age, have already been announced in the US (CW, October 5).

The new memory usea 16K bit chips and is available in increments of 256K, 512K and 1.024K bytes. Its use raises the maximum memory size from two to eight Megabytea. A one Megabyte increment now costs

for the VAX-11/780 have been announced ment of operating ayatems, compilers, second, and can be used either in single by DEC to help users with their reol time run-time system components, database systems, communications aoftware and

> It translates source programs into re-The OLISS compiler costs £12,000 to buy.

or the whole system can be licensed for Two new direct memory access Interfacea have also been announced. The

LPA11-K system transfers data at an costs £9,923.

The other new product is the TU45 tape subsystem, which has a read/write speed of 75 inches per second, data densitles of elther 800 or 1,600 bits per inch, and a data transfer rate of 120,000 chps. The ninetrack alave drive version of the subsystem

user mode or for the control of up to eight

experiments simultaneously. The DR11-8 system is a 16-bit parallel interface for

applications requiring higher data rates. The LPA11-K costs £5,265 and the DR11-B.

First major customer

CONSUMER buying guidea will form a subatantial part of Garic's 8,000 page Prestel Information Provider service, and Garic has signed up its first major customer for 400 pages. The customer is Comet Radiovision Services, the electrical goods diacount house. Saric will prepare the pages, updating aome of hem weekly to show Comet's

latest goods and prices.
Comet will pay £10,000 for the irst year to reach Prestel sub-

AN order processing, stock con-trol, and accounting system dereporting and sales ledger appli-cations. Talks are also taking signed for operation by Inexplace with Gamma on the perienced users has been intropossibility of adding a word pro-cessing copability for mailing duced by Gamma, and will have Its first public ahowing at the Compec exhibition which begins purposes, and purchase/ nominal ledger and budget on December 5 at Olympia. Called Salespac, it is based on Digital Equipment hardware,

the Feltham-based branch of Konica Cameras. The Konishiroku system uscs a DEC Datasyatem 354 to hundle

forecasting facilities are to be provided later. A typical smail Salespac sys-tem would consist of a DEC 320

Salespac debut at Compec exhibition

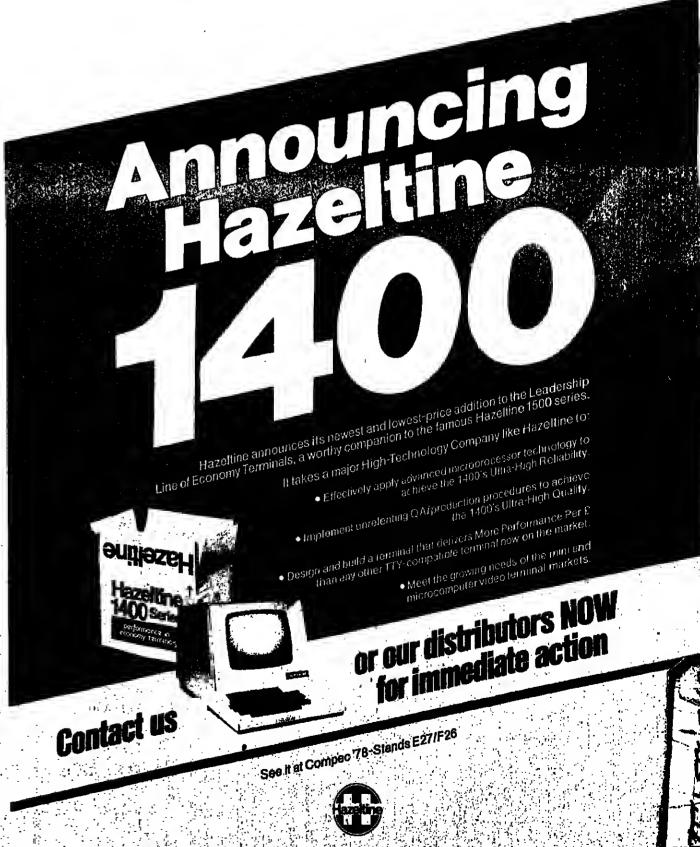
and Gamma's first customer for the system is Konlshiroku UK, processor, two VDUs and a line printer, and this would cost about £21,000, while o large system, based on a PDP-11/70, order entry, nrder processing, could support up to 32 VDUa HQ in The Hague.

stock control, management and cost about £120,000

Software, which is written in Diboi and can be run under elther the CTS 300 or CTS 500 opcrating systems, costs £5,000

200th Filetab sale

WITH en order from the Insuranca company, Equity and Law, the NCC has chalked up 200 overseas sales of its Filetab file maintenance and report generotor package. Equity and Law will use the software at its Dutch



Iszelline Limited, Terminal House, 14 Petersham Road, Richmond, Surrey, TW2 58H (et. 01-948 3) 1 1 Telex: 928572 [Aparida Butta Machines Lint. Chlorida Road, Northanplon NN1 68L Tel. No. Northanplon 21st 1; Tolex: \$1804.

Scotland: Fortrand (File) Ltd., Donbrieth Industrial Estate, Dunlengtink, File KV11 8/M Tel. No. Delpin 3 Bay 83312 [Telex: 727458.]

S.E. England: Rein Jaminints, cet New Street, Lottion W224 (875, Tel. No. 0) 4864 4888. Telex: 2864572

N.W. England: Specialist Office Supples, 260 4/271 Bettow Moor Road, Christon, Christon, Management, Tel. No. 081 081 081 0757. Telex: 487 151.

Industry, Technico (Committee Products Linting 22 (April) Place, Waterplane, Bartolitic PG31 (148, Tel. No. 0734 781 384, Tel. de. 84 7830.

S.W. England: Germa Committee Products Linting 22 (April) Place, Waterplane, Bartolitic PG31 (148, Tel. No. 0734 781 384, Tel. de. 84 7830.

From this diagrom it can be seen that: ITEM is a direct key for DESCRIPTION and for QTY-IN-STOCK. ORDER-NO. Is a direct key for CUSTOMER. CUSTOMER Ia a direct kay for SALESMAN. A concatenation of ITEM and ORDER-NO. is a direct key for

CA-DYNAM/D Disk space and catalog management system for DOS, DOS/VS users

Like adding more disk drives ... for free!

By slashing disk space naeds saven different ways, some of our clients calculate that CA-DYNAM/D peid for itself in lees than threa months.

Here's how I One: CA-DYNAM/D allocates only as much space as is actually needed ... snd does it automatically.

Two: it automatically. releases unused space. Three: it allows all partitions to shere any one work area. Four: it Ilmits fragmentation of disk volumes. Five: it allocates secondary spece. Six: it allows sequential files to be deleted automatically efter closing. Seven: the DYNVTOC display and various disk space utilisetion reports help optimise use of davices.

Up To 40% Diak Space Savinge

Disk apace savings elone can easily run up es high as 40% in the average IBM centre running anywhere from four disk drives on up.

That adds up to e lot of extra disk drive capacity you

We have a chart that shows you how much savinga sre required for CA-DYNAM/D to amortise itself within a given period of time. After that,

can use to put off the dev when you reelly need to add more drivas.

it's pure profit i

C1 Please cell me, I'm intareated in knowing mora about CA-DYNAM/D Compan Addrass Telephone (aree code

Plue Other Benefite

Valuable disk apace sevings is only one of several other benefits you realise with CA-DYNÁM/D.

For example, you can count on an immediate and measurable increase in throughput. Aborted or bypaased jobs are eliminated. Programmer productivity goes up because there's no longer any need to map disk file addresses - or keep track of file size or other attributes. File security, too, is improved...

CA-DYNAM/D has a number of other features that help make it the fastest aelling. Disk Space end Catalog Management System sold today.

It's svailable to you entirely without obligation for a 30-day trial evaluation. Just call us or send the coupon today!

COMPUTER ASSOCIATES

David Tory,

EL: 01-452 0490



AN AN

RUBIDE

Take away Tallys from £1600

Contact either BRUCE CANE or JAMES WICKES on 01-658 5906.

ACCOUNTANCY & COMPUTER PERISONNE

ALL COMPUTER STAFF

CONTRACT & PERMANENT FOR A PERSONAL SERVICE **CALL 638 9841**

FOR SALE

IBM 5496

DATA RECORDER

with IBM Certificate of

Maintenairce.

OFFERS TO D.P.M.

Bourne (Trimpot)

Hillend, Fife

(0383) 823221

Hewlett Packard

9825A for sale

All ROMS

As new

01-637 0777

Nelson Computer Services Ltd.

URGENTLY REQUIRE

Univac VIP'8

Tel. 07082 29125

St. Johns Coun

Secup Road, Rewensia

Lancs.

COMPUTERS

BOUGHT

AND SOLD

E O B EQUIPMENT LTD.

Tel. 0783-293818

Telex 537763

'GIVE US THE ...

toole, food, clothing, heeting

involved in caring for chitdre

If you give us — not tools — bu

your computer weste, we can do the job of caring tor over

5.000 children who need love.

CAN YOU HELP?

Please contact

Paul Herrison

etional Children'e Home

85 Highbury Perk London N5 1UD

.01-226 2033

we'll do the job'

- end much more

care and security.

- ell cosi money, but ell ere

FOR SALE OR

LEASE (Subject to continuing availability and contact.)

IBM 370/158 — III

IBM 370/158 CPU (U34) Two (2) Megabytos ISC — 3360 Available: April '79 4-year Leese £13,850/month Selling Price: £545,000.

IBM 370/148

8M 370/148 CPU Two (2) Megebyles ISC — 3350 Aveileble: end Feb. '79. 4-year Lease £9,800/month Selling Price: £395,000

IBM 1403 - NO1 Printer 3-Yeer Leese £410/month IBM 2821 - 002 Control Unit 3-Year Leese £350/month IBM 2501 - BO2 Cerd Reeder 3-Year Leese £170/month. All available on Short Octivery

COMMUNICATIONS

IBM 3272/2 Control Unit IBM 3277/2x6 Display Selling Price: £16,800.

ALSO

370/135 CPU. Immediate 370 / 115 System: Immediate

> TELEPHONE: PREMIER COMPUTERS

on 01-940 1134 or TELEX THEM on 926734 NOW!

Fungus is mushrooming everywhere

Genuine Dec items and compatibles available, immediate ex-stock deliveries, enormous savings. Installation and maintenance contracts arranged on all products.

Why not let us quote you?

COMPUTER PRODUCTS LIMITED 16 ALBION STREET, CASTLEFORD, W.YORKS.WF10 1EW TELEPHONE: (STD 0977) 55011/550577 TELEX: 557644

am TASK FORCE

Computer Consultancy Services

The very best operators, programmers, anelysts and consultents are available for essignment in UK and abroad. Wa have creemed the best skilf and experience from the contract market — we have a strong management team responsible for the performance of each individual and the success of each project — we have established a stable work force and can offer much more continuity because of our service to contractor.

Task force your opportunity

We are Computer Contract agency with a difference.

We can give you more cash, more jobs and more benefits: this is how It works:

We will pay you very competitive rates and give you regular work. You don't pay PAYE because you will be a limited company; this gives YOU controf of your tax payments.

We will solve your administration headaches, your compeny set-up, book-keeping, invoicing, account end tax returns will be done for you, by professionals es e free

Registration for VAT benefits you on all your inputs. Wo, of course, administrate ell the accounts

As a limited company you can move a leesed car errangement (tex-free payments), which we can provide and organise for favourable terms.

We can get you insured egainat long-term sickness end set-up a pension plan. Long-term servico qualifiee you lor

End-of-contrect bonus scheme end retainer deels can be

We ere only interested in good relevent experienced;

contracts eveilable immediately ere: Operetors, fBM, ICL, Honeywell, all ereas, from £180 pw

North enalysts and consultents £300 pw Honeywell programmers £250 pw Midlands ICL file teb £300 pw IBM Systems progremmer OS/VS, CICS end power ICL/IBM conversion Cobol progremmers £275 pw Honaywell Cobol£250 pw South IBM Cobol South IBM Cobol £250 pw IBM Cobol OS /VS & CICS £275 pw Honeywell Cobol/fDS£250 pw ICL new renge from £250 pw Europe operating System Designers Munich Systems/progremmers, OS, MVS/VS1 £350-£550 pw

These and meny other contracts will be forthcoming; so i you are the best, give us a ring:

am TASK FORCE LTD., 630/634 London Road Southend-on-Sea, Essex, SSO 9HW Tel: 0702-331400

A STATE OF THE PROPERTY OF THE PARTY OF THE

PDP11/04 and 11/34 Systems and Peripherals la

Also various Refurbished PDP8 and 11 Systems, as Modules from stock.

> ** SEPTEMBER OFFER ** PDP-81 Bk Fully Returbished, £1,200.

S.K. SYSTEMS LTD. Stevenege Road, Hitchin, Herta Tel: (0462) 35267 Tolex: 826715 S.K. SYS.

> WANTED **IBM SYSTEM 3/15**

International Company requires an IBM system 3715 preferable Model B for its operation or SWEDEN

Please contact JOHN ARNUTT nt Port Glasgow f0475] 41631

LOOK AT THE GROWN

Our Markef Place lealing (today on page 20-21) erable you to reach a vast (12,000 circulation of whom notes the 91% personally request their capies. No wonder wealing more display advertising than any other computer found 35% of all computer ads appear in our pages—and Market Place is the most cost-effective of all for leasing, 2nd hard hardwarn, maintenance services, wholosale goods and confract staff ... The rates are:

> 3.35 s.c.c. £9.35 36-98 s.c.c. £7.70 99 a.o.c. and ovor \$8.05

Series discounts: 7-5%, 13-10%, 28-15%, 52-20%

If you ere interested in a particular article/special Feeture or advertisement published in this issued

COMPUTER WEEKLY

why not take edvantego of our reprint service. Reprinta cen be secured et reasonabla cost to you own specifications providing an ettrective and value able addition to your promotional material. Minimus

For further deteils contect
Brien Bennister, IPC Electricel-Electronic Press International Phone 01-281 B046 or simply complete and the comple the form below.

To Brian Bannister, Reprints Depertment St. 919.
Dorset House, Siemford Street, London, 65. I am interested in

edvertisement heeded COMPUTER WEEKLY

on page(s)

Address

Wataprintey Wataprintey

€950



ELECTRONIC BROKERS LTD FOR USED DP EQUIPMENT

> BUY OR SELL THROUGH NEW DE LUXE 80 COLUMN

(W∅D0P HAND PUNCHES (EX-STOCK)

(W) D) P

WEBSTER D/P SERVICES LTD. 15 WIDMORE ROAD, BROMLEY KENT BRI 3AA

* OPERATORS * * PROGRAMMERS * * PUNCH OPERATORS *

LEADING SUPPLIERS OF CONTRACT OPERATIONS PERSONNEL THROUGHOUT EUROPE

> SAVE TIME AND MONEY CALL US FIRST

LONDON 01-493 5736/8 **MANCHESTER** 061-833 9343 OON STREET, LOND

CoOperators supply first-rate contract operations staff for long or short term needs

RING 01.836 841



SYSTEMS

D.T.C. Taskmester end Microfile eystem evaifeble with up to 4 ports, 4 floppy disca, 64K addressable memory 10 MB herd disc aveilable from

D.T.C. 3B2 end 302/T Hylerm printer. CALL US
Application Software single and multi-FOR A
user turnkey business and wordprocessing systems. QUOTATION

168 FINCHLEY ROAD, LONDON NW3 6HP **TELEPHONE: 01-794 0202**



pgrading? Program Maint.? Sickness?

Holidays? Downgrading? Peak Work Loads? New Systems? Weekend Overtime?

01-593 5474 Johurch 56218

Systems - Programming - Operations

When you need Contract people, Computer Two Thousand will make your life easler.

Contract Operator, Data Prep. Programmer/Analyst Staff

We have completed even \$.0000 one perhabition the minimum and the configurations in Europea With United Starges Companies services in Implication BUC Disasolve in behalfur, course the trame you continue.

Knight 01-491 4706

Enight Computer Services Limited, 14 Old Park Lane, London Wil-

Company interested in currently aveilable

ELECTRONIC BROKERS LIMITED
49-53 Pancras Road, London NW1 2 QB

PRINTERS & TERMINALS

TELETYPE MODEL 33 INPUT/

AZELTINE VISUAL DISPLAY UNITS

SUPER SAVINGS ON MASSIVE

MINI COMPUTER EXCHANGE

BIG SAVINGS ON OUR LARGE STOCKS

F DEC PROCESSORS, PERIPHERALS,

ADD-ON MEMORY, OPTION MODULES

ONLY £350

ONLY £495

£2,500

ENTRONICS MATRIX PRINTER MODEL 101A 165 (hauscule pai second. 132 print positions adjustable paper width 4 to 14%; Ventral Farmat Control 6 2 7 dol mains Parallel Interface 84 ASCII cherecier sei

OUTPUT TERMINALS

BULK PURCHASE

Teletype Competible

12" Diegonel Screen TTY Formet Keyboerd

5 x 7 Oot Metrix Switch-selectable

up to 9600 beud

Standard CCITT V.24

64 ASCII Cherecter Set

Transmission Speeds

Switch-selecteble Perity

AND RACK CABINETS.

FDP 11/04 Processors with MOS of CORE Alamayin Blood 15K Incremente AS NEW CONDITION OTHER CPUS CURRENTLY IN STOCK

115 4K core stack with back plane (11/15, 11/20) 116 8k core stack (11/05 11/10)

MM114 Sh.com stack [137.05 1 7.10]

MM110P 18C points cale 1137.05 1 1.34)

MM110P 18C points cale stack [11.38 117.40]

MM110P 18C points core stack with backplane [11.35 117.40]

MM111P 18C MOS 117.04 117.34)

MM111P 18C MOS 117.04 117.34)

10P8 SERIES
LEGIS SICK OF CPUS -- POPSE, POPSM, PDPSE, POPSE
PLUS ADO ON MEMORY AND WHOE RANGE OF OPTION MODULES
ALL AT GREATLY REDUCED PRICES!

NEW CATALOGUE NOW AVAILABLE

COBOL based software packages

for epplications involving sales order, stock control, tedger etc. to run on 0 G compatible micro computer besed system.

Write for full details to: Sox No.: 1897.

SM 370/188 JOO evaleble ehortly SM 370/148 JOO evaleble November SM 370/148 eveileble Immediately GM 370/168 100 and JOO evalleble D ISM 370/128 GF2 available immediately ISM 3348 Onto Modulae eyellable

DATA SERVICES HAVERING LTD.

Mein office

Revieigh 770698 Hockley 6887 Lerge volume work our speciality. Delly workloads welcomed Collection and delivery service. Competitive prices.

DATA PREPARATION & SUREAU SERVICES 3742 Kay to Disk — pick-up and delivery service specialising in el

tBM System 32 — hends on testing eveil. Provides extended services on date prep — RPG Compiling — Dete Listings.

Contact Ron Davies for further details: MOSLO SYSTEMS LTO., 01-502 5568 201 Hollend Park Avs., London W11 4UN

WANTED over 100 units/

- TICKET PRINTERS — CASH DRAWERS to be connected to LSI-11. 8A8CO, ev. G. Smith 38 Colmer-Serg, Luxemboo

WANTED

Used Disc Pecks

Ring Miks Willisms 01-778 2006

PANDEX

(COMPUTER SERVICES) LTD

computer services limited

CONTRACT or PERMANENT— ANALYSTS - PROGRAMMERS - OPERATORS PUNCH OPERATORS DATA CONTROLLERS

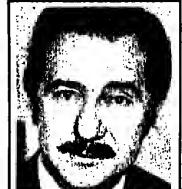
Tel. 01-487 5781 284 Devonshire Street - Loridon - W1



Contract & Permant of recrulation Total DP Support at Itabea Programming: Operating Data Preparation System Data Control Istennical







When the Industriel action at Her Majesty's Stationary Office is over. the report of the Date Protection Committee will be published, elone are likely to be those outlined in the leeked report (see page

In this article, written before he had seen news of the likely contents of the DPC report, director general of the Computing Servicee Association Alan Benjamin suggests that we should go back to examining the issues invoived from first prin-

Privacy: Let's go back to first principles

people find the subject of moment) contain data on privacy confusing. Protection "natural persons" (as opposed to tion of the individual from the corporate entities). invasion of his privacy is a contplex legal and social issue and one which is of interest chiefly in those countries where free discussion of the Issua is possible.

Data protection can, however, be a powerful tool for liberty and personal freedom in ways which are wider than those associated just with the individuel.

Like all new phenomena, it hes its possibilities for obuse and and affect the use of computing, which is why I am concerned.

Although we connot yet know what the Data Protection Committee has sald to the Home issues which have been reflected in legislation and draft regula-

Realismion of the possibilities for misuse of data, deliberately or eccidentally, caused the whole movement of individual privecy protection to start.

It was thought that computers heightened these possibilities. and those concerned with the liberty of the individual found the computer a convenient target. The computer was little understood, and for that reason some of these are now visible feared, and it was overwhelmingly used by the establish-

the report of his commission's work, and other researchers Secretary, we can guess that it found no evidence that comhas wrestled with some of the puters, offered increased dengers, only that the use of computers posed different protions in other countries. These blems from those set by the use concern the licensing or regiat- of manilla envelopes or loose would ipao facto be subject to

ORPM

MATRIXSTORE

The Memory that doesn't spin! ZERO RPM.

current eyetem and programe can't tell

from the drum it was deelgned for.

The only difference you will notice is the

incredible improvement in throughput

bscause MATRIXSTORE has a data

access time that's anywhere from 28 to

118 times faster than the revolving, mag-

netic machine it replaces. Of equal impor-

tance, MATRIXSTORE will transfer data

to your CPU up to 4.6 timee faster than

MATRIXSTORE! Ready now as a plug

compatible and software transparent

replacement for the FH432 of FH1782

Meneging Director, Link Date Systems

Ask for MATRIXSTORE, the memory that

Ltd. on 0923-40704 or et 26 The

Parede, Wetford, Herts WD1 2AA

your Interlaced drum.

doesn't spin. .

Revolving Magnetic Machine.

Please contact Mr J. Hervey,

MATRIXSTORE connecte to your CPU

where fixed head drums and disk used to

go. Moreover, MATRIXSTORE continues

to function long after a drum guits. With-

out belte, gears, bearinge, motors, heads

or platters, there is nothing to wear out,

burn out, or crash. Nothing spins, nothing.

MATRIXSTORE Ie the astonishing new

memory from Amperlf Corporation, the

Memory Company, that uses axtremely

reliable semiconductor storage inetead of

rotsting, magnetic media. Over the long

haul, MATRIXSTORE will save you en

MATRIXSTORE provides vastly improved

systam throughput, memory availability,

and system uptime. Operational charac-

teristics are outstanding providing up to

700 parcent savings in floor space, power,

cooling, and PM requirements. You will

raalize a drastically improved raturn on

Unplug that first generation drum machine and give MATRIXSTORE a go, MATRIX-STORE comes in storage modules of 262,144 or 2,097,152 words that your

astounding amount of money.

your Investment.

which were becoming dependent upon information systems much of the administration.

As concern grew in Europe working parties and commissluns all researched and reported. The issue widened from that of the rights of the individual, to that of human rights generally, then to the sovereignty of nations end most recently to a "new world information order" now being heralded in most UN conferences.

Fears emerged that If files containing personal data on one country's netionals were held in enother country's detabases. somehow those files and, by extension, the people referred to

"natural persons" (as opposed to the protection of an individual's not non-personal data or even privacy were a response to a nll data? Were countries not real need in those societies likely to be made "data slaves" of those who were rich enough

or clever enough to collect, ana-

lyse and process such data? In addition information was increasingly being transferred hy data communications systems, over satellites and with little inspectlan. This was described in one particularly paranuiac sessiun at the Vienna Symposium in October 1977 as "dntu robbery".

The whole dehate had now taken on an international dimension, with the European Parliament Council of Europe, OECD, EEC, the United Nations and other bodies oll involved.

The problem has been clear from the beginning — either data can flow freely from anywhere to anywhere or not. If it is impeded, then com-

nunicetions, gond or bad, will lecline with consequent effects on traile, knowledge transfer, interpersonal cuntart and competitive forces.

Ouried in this mass of activity

data on natural persons is use

In 1978 the CSA submitted recommendedons to the D. Protection Committee and in the kernel of those recome dations was edopted by the British Computer Society: 1131'M (then DPMA) and by European Computing Strip

There were two essent I. That eny kind of legicles or regulation contemplant the government should any the use of dete and not the

2. Thet e "beneficial use" the UK should be made; ponsible at law for comple-This "beneficial user" wat: person or organisation whom or on whose behat? for whose benefit data si lected, sorted, protessed,

These principles have of the test of many debats a alternative suggestions for serve two intrinsic point responsibility is assigned a::

By Alan Benjamin

originating regularment—that storage. an individual's privacy needs In the CSA submission lechnology which offers the embraced data on ind menns of thrent also offers the was suggested. The be

Among the many sub-issues use the data and was which have urisen is one of granted such pennission. putential danger - that data codes of practice (inch. low regulations and data protection laws could be used as invlsible trade harriers, or in some way manipulated to equalise technological positions.

It is obvious to all plans that there are many stresses and strains in the world trading position at the moment. Traditional industries are declining under the dual attack of lechnology and hetter produc-livity from the third world.

Adaptation comes band to the old world — especially where it is required organity and is on a large scale, simultaneously affecting many traditional activities; protection is easier and both psychologically and politically popular. As resources are devoted in protectionism. the needs of new growth industries or fiedging technologies are

So it is with data. The protection syndrome is at work not for the nriginal purpose uf Improving the social animusphere for Individual, but economic reasons.

Wc must renlise that the flow of deta around the world is the very lubricant of freednin os we underatend it. Trede, information, knowledge, technology — these all are able to pass freely from person to perenn, firm to firm, netion to notion.

Oppressive systems of government are made weeker by the evaliability of information, not by its suppressinn. The presence of fect, dota, choice and option, oil represented in information, is anatheme to

such regimes.

Another derivetive of these issues is the now inflated. issues is the now inflated monster called security. Some regimes believe that accurity can be a matter of law and regulation whereas — as logic and experience since the beginning of history tell us — it can only be a matter of practice and sound organisation. It is to be hoped that the Date

user" would seek pends thuse relating to see-

The CSA felt that this big regulations on data proces it is negued that similars.

in other countries would be a network of data proted standards providing sales. for the citizens of those w. Irins, Processing could it place in any county st observed such standards and appropriate "beneficial" the point to which me plaint could be directed to

The flow of dath in !! eded — and here is the potential of the porting liberty for the

No. licence would be 6 to a benericial to to, or process personal by country that did not subside such standards. Of cours low could be broken, but are other systems of low deal with breaches of low could be broken, but are other systems of low deal with breaches of low subside low looks are other systems of low looks are other systems of low looks are other systems of low looks are other looks are oth

deal with breaches was a second of the condition of the c



PUBLIC SECTOR

SIEMENS

The Word Bank is open for business

As a member of the computer industry, you'll already know that in the fast-growing word processing segment the rewards are practically limitless.

Siemens, whose word processing system is amongst the European market leaders, has recently introduced the Word Bank into the UK and is looking for new members to join an enthusiastic team.

Software engineer/analyst Word processing sales

If you're the person we want, you may be feeling you're in a technical 'cul de sac' and that your specialisation in computer industry technology is holding you back from meeting people.

We'll want you to be involved in client contact. Of course, you must have proven technical know-how and experience but, just as important, you need to understand the business problems and potential of customer-clients. You'll be dealing with senior management and discussing benefits and applications of our 'Word Bank' system. There's an attractive salary, in line with experience.

If you're the person we're looking for here, you'll almost certainly know what we're looking for. Very simply, it's selling experience and a proven record of

The Software Engineer/Analyst advertisement alongside, should show you the way we think and the kind of support you'll get. There's an attractive salary and commission package.

For both positions there's full training and the benefits of working for a company employing over a quarter-million people world-wide.

If you think you've got what we want and we may have what you are looking for, contact Tony Weeks, Personnel Manager, Siemens Limited, Siemens House, Windmill Road, Sunbury-on-Thames, Middlesex. Telephone Sunbury 85691.

These vacancies are open to male or femele applicants.

THE EUROPEAN CENTRE FOR MEDIUM RANGE WEATHER FORECASTS

besed at Shinfield Park, Reeding, Berkshira

is inviting applications for the following positions:

COMPUTER OPERATORS CONSOLE OPERATORS

Tha computer system includes a CDC Cyber 175 linked to a CRAY-1 large scale scientific computer. A privete natwork is being established between European Meteorologicel Offices and our Headquertera.

Computer Operators

The operators are required to control the computer complex. Successful cendidetas will be required to work in a 4-shift cycle, including weakends end public holidays, under the supervision of a Shift Leader. A minimum of 2 years operating exparience on a large scale computer is required. Exparience with CDC systems would be an adventage.

Computer Receptioniets

Duties involve working with computer peripherals and off-line equipment. Other work involves distribution of computer output and tape duties. These poets involve direct contact with computer users. 1B months' experience is required either as a computer operator or computer

The REMUNERATION for these positions is in accordance with the relevent scales da appliceble in Inter-governmental Organicationa, being well ebove national U.K. averega.

Application forms can be obtained from ECMWF, Shinfield Park, Reading, Barkshire RG2 SAX. Telsphone: Reading 85411. Telex



PROGRAMMING TEAM LEADER TO £6,000 NJC G.7 SENIOR PROGRAMMERS to £5,500 NJC 8.8 PROGRAMMERS to £5,000 NJC G.5

As one of the most edvenced Honeywell large uaers in the UK, wa're into database and TP in a big way, using Honoywell's least and but soll-ware — IDS-2 and DMIV/TP — all under GCOS.

The installation at our naw Computar Cantre comprises a dual Honaywall 66/10 with 384K diec storage, tepes, printers and a mejor natwork of terminale besad on incoterm's 20/30 control-

Our first applications ere well underway with e major Customer Sarvice Systam due to go live in April, 1979.

t. Trogramming Team Leader to take teaponsibility for a programming project team and to assist with system and program specifications;

- the best COBOL PROGRAMMERS ground to implement a variety of integrated systems using modular/etructurad progremming techniques and on-lina program development.

If you have the experience - but not on Honeywell 66 - we'll train you.

We're located in Huntingdon, an area of reasonable housing costs which offers a wide range of leisure pursuits. With Cambridge only half an hour sway-and within one hour of London by train, the overell

The Authority offers excellent conditions of service and generous removel expenses if relocation is

If you're interested or want to know more about these opportunities, why not call Jenny Spencer at Huntingdon (0480) 56181 Ext. 371, for information and an application form.

The closing dats for applications is 30/11/78, and should be sent to: ANGLIAN WATER AUTHORITY

Brook House, Ouse Walk, Huntingdon, Camba, PE18 6NZ

PUBLIC SECTOR

Applications era invited for the following posts within the Polytachnic's Management Information Centre based at the Waltham Ferest

Head of the Management Information Centre

(Principal Lecturer) (Ref: S/BE.120a) Responsible for the provision of management information and the development of planning systems for the Polytechnic.

Senior Lecturer

(Managament Systems) (Ref: 8/BE.120b) To administer, devalop end, lecture in, menagement information

Systems Project Leader (PO1(a)) (Ref: 8/BE.120c)

To supervise the development and imp

The above posts will contribute to the Centre's provision at a management information and planning systems service to the Polytechnic as a whole, and candidates should be able to demonstrate appropriate experience in a relevant lists.

Applicants should be graduates, preterably with peel-graduate research or professional esperience for the PL and SL past, and with professional experience for the PO 1 (a) post

Salary Scalae:

Principel Lecturer: £7,047-£8,844 par annum Senior Lacturer: £6,051-£7,572 per annum £6,012-£6,627 inclusivs' Plua London Allowanca

Further datails and application form from: The Senior Academic Personnel Officer (2) North East London Polylechnic Forest Road, London, E17 4JB Tejaphone: 01-527 2272 (Extension 20) Closing date: November 30, 1978

North East London Polytechnic

THE UNIVERSITY OF LANCASTER COMPUTER SERVICES

Applications are invited to fill the following posts 92/1/A OPERATIONS MANAGER

The Meneget to undertake complete respensibility for all operational aspects of a university computing service and to take a leading tole in the installation of an ICL 2860 computer with network links to other North-West Universities in 1979. A Cognes or equivalent is required as well as previous operations expellence. Salary scale: E6317-£7784

92/2/A SYSTEMS PROGRAMMER

(O.R. Grade 1Af

The programmer is join a seem toeponsible for the development at sperating systems and final claim of systems executed with an ICL 2980 to be delivered in 1979. An important systems responsibility is participation as an inter-university team responsible to the development of the North-West Universities Computer Natwork. A degree or Salary scale: £3384-£8588

92/3/A APPLICATIONS PROGRAMMER (O.R. Grade 18)

services suppost including documentation, package development, solkware writing, lecturing and advisory duties. Lielson with other North-West Universities is importent in this context. A degree or squivalent is required and preferably some asperience in a messich Salary scala: £3384-£6804

Further porticulars may be obtained (qualing appropriats reference number) term the Establishment Officer. University House, Lancaster LA1 4YW, to whom applications (8 copies) naming three referees, should be sent not late; than 30 November, 1976.

HYDRO-ELECTRIC

SYSTEMS **PROGRAMMERS**

£4.660-£7.146

The North of Scotland Hydro-Electric Board will instell in their Computer Centre in Abadean Qual I.C.L. 2960 computers to mid-1979 to replace their wall established System 4 equip-

hansive software including database will be used.
Experienced Systems Programmere are required to develop this oftwere and those with a knowledge of VMES, MAC, TP or

IDMS would be particularly welco Salaries will be in the ranges £4,660-£6,030 and £5,492-£7, 146 including Productivity Bonus (Etectricity Industry PAG3 and PAG4 scales) and generous essistance with removal

If you went job satisfaction in a etimulating environment phone Ken Hutcheon at 0224 692671 for lurthes information or cond details of your qualifications and career to:

Computer Services Manager
North of Scotland Hydro-Etectric Board
Computing and Accounting Centre
200 Ashgrove Road Wast
Aberdeen A 89 2NY

MATURAL ENVINGHMENT DESEARCH DURCH — HEADQUARTERN — SWINDOW

HIGHER SCIENTIFIC OFFICER/ SENIOR SCIENTIFIC OFFICER ANALYST/ **PROGRAMMER**

ie Gecunher. 1978, the HQ at MERC will injust a mini composer is their new offices at Swindow to be used for their administrative processors and intercention waters.

information appless
for the hydrogeneous in required to work will
not appear in the Sent singles of descriptions

Qualifications/Esperience
A dyra, little or optivated qualification, with all
host four years' experience of developing and
ingternating ne-line flassocial and/or administ-ratives explained insidents and least area year's
ferirus IV programming superience.

Salary and conditions
The appaintment will be to the beginn Education
The appaintment will be to the original Education
Officer or Sector Schooling Officer grafs, Blacking
stary will depend as ups and experience between
In the Schooling
In all crease parts

In all crease parts

Endor Schooling

In all crease parts

In all crease parts

Endor Schooling

Andrew

Andrew

London

To School

Andrew

London

To School

Andrew

London

To School

Andrew

London

To School

Andrew

London

The School

London

London

The School

London

in mil cusas amusi inava starting ri 22 daya pies 10% daya public and privings balldays though to a new-contributory experiencent

scheme. Staff of the NENC are not Civil Beryselr but the pay and condition of service are similar to the Educat tas W-Astural Environment Research Council, Polarie Soune, Herth Bio Avenne, Herbelon, Witshire. Closing data for applications; & Decamber, 1978.

RATURAL ENVISORMENT RESEARCH

SYSTEMS **DESIGNER PROGRAMMER**

A science graduate is movined for the computer operation at a becared identification service. Bacteria from Clinical sources are identified by probabilistic analysis of lest results by selectric to computer stored data bases. Systems use Opicial Bark Readat forms. Date Recognition (Osteterm 3) Mechans. Evide punch tape Jerminel connocted to the LUCS COS 6500 time shound system, cannot solivere in FDRITAN IV. There is conseduable traps for improving the responsiveness of the system and the alticular transpe and striaval of date, and to cover the methods laggest applies electricity.

Cood dates with 11ve years' past graduote expedence may be appointed to the Senior Sciences Orade

Salary on probettomary scale 12,981-£4,275 + Landon Watphiling, Pasi Probationary scale £3,788-£4,884 London Watphing or Senior Sciencific scale, if applicable, £5,451-£6,637 + London Watphing.

Ring D1-205 70A 1 for a more detailed job description (Dr. L. R. Hill, on Extr. 47) and for conditions of employment and application form (Personnel Officer on Extr. 48)

COMPUTING CENTRE

SYSTEMS PROGRAMMER

The Centra operates a linked ICI 1998A/1904S configuration under the George 3 operating system, together with two DEC PDP11/40's providing data preserving. regarder with we bee, PTT/140's providing dasts preparation and a CTL MOD to providing BASIC. The Centre is else actively participaling in the development of a new regional network which will fully interconnect the main conjusting actives at the aix Midland Universities.

cuful candidata will be rete succeedud candidata will be req-ted to work in a group providing user ud operations support (planning and wherever support systems software) and to support systems software) and to relabula to the Center's development relabula to the Center's development relabula to the Center's development relabulations and budgetting, what flow the duling and budgetting, what flow the duling and online networks).

Experience of scientific programmin language is essential (preferably FOF TRAN, ALGOL 60 or ALGOL 68). initial salary will be in a maga c \$8,804 (under review) with US scooting to age and experience. Fürrhik particulars and forms of appli-Calibn, mateuable net kiter has 27th November: 1879; (rom ike Siett Appelniments Officer, University of National University Park, Nos-chapten NG7 28g, Ref. No. 538.

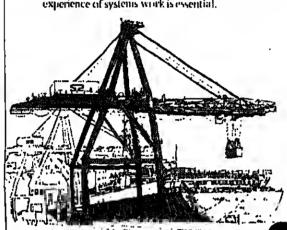
Systems Development and Operations Staff

Salaries: to £5,720 annum

The Ilritish Transport Docks Broard Computer Centre privides computer systems development and operations services to 19 ports and other port industry organisations The Centre has completed a major review of the ports computing requirements in preparation for the replacement of its large mainframe computer. Mini-computers with visual display terminals and communications facilities have recently been installed at major parts to link up with the empirement at the Computer Centre. The Board require the following staff to facilitate the introduction of the new equipment, to work on a number of interesting new projects and terprovide continuing support for existing systems. support for existing systems.

Systems Analysts

Responsible for systems analysis, design, development. implementation and muintenance activities and liaison with programming, operations and user staff. Previous experience of systems work is essential.



Programmers

Colod and/or Assembler experience essential. For more serior positions, will be responsible for suite and program design, specification, coding and testing. Will supervise mogramming staff and liarse with Systems and Opentions stall. Knowledge of structural programming techniques would be useful

Computer Operations Clerks

The Operations Clerks work on a shift hasis (for which one operations Cierks work on a stift hasis (for which additional payments are made) and will be required to operate the Centre's present ICL system. I compute its eventual replacement, and the data transmission and ancillary equipment. They will also nudertake data control duties which include liaison with users, assembly disassembly of computer runs and despatch of output. Provious experience of similar work is essential.

Punch Operator

The Princh Operator will be required to specificate, paper tope and Reddon Key-to Disc equipment and also to assist in data control work.

These vacancies offer the opportunity to join a professional and friendly team working to high standards Some travel within the C.K. may occasionally be required. The Centre is easily accessible from the M1 motorway and Hayes and Harlington Railway Station (Western Hegion) Conditions of service include 32 days holiday per amon including Bank Holidays, a sick pay scheme, pension scheme and tolp per day him been venchers. Applicante in either to confact Tim Bever, Systems and Programming Manager of Jue Dealin, Computer Operations Manager on 11, 374,501,5 or write to Bright Transport Docks Board, Computer Centre, Hayes Road, Southoll, Middlesex U112,5NE.

British Transport Docks Board

LAMBETH COMPUTER CENTRE

needs a **COMPUTER OPERATIONS** MANAGER

[£8948-£7865 Incl.]

Our Operations Manager has recently tett us and we ate now tooking for his toplacement. We have a twin ICL 1900 Inetellation (128K 1903T and

49K 1902A) with extensive communications teclirities termineting one 7903 front end. In eddition e 32K . Redifon Seecheck System with 13 key stettone is installed in our data preparation eree elongside en optical merk

Good practical expenence in the management of people is required and eleo experience in the performance and acheduling of two mainteness with a large batch workload (our programmee use Meximop).

Should you wish to find out more about this job, give Mr. Webb (the Computer Centre Meneger) a ring on 01-274 7722 Ext. 437 or Chris Wrey (our Personnel Officer)

Application form obtainable from Personnal Officer, Directorate of Managament Services, London Berough of Lambeth, 18 Brixton Hill, London, SW2. Telephone 01-733 7944 Ext. 221. Cloeing dete 30th

.AMBETH

FULL TIME TUTORS REQUIRED

nternational mining organisation, due to expansion within the tutorial legariment are seeking three additional tutors to seek T.O.P.S. and programming and programming. We anvisage a minimum age of twenty-live years and at least two years in computer programming of operations and preferably with a leaching

Telephone: Mike Grosse on 01-388 0891 or write in the stricter

Programmer

We require, for work on an ICL 1903T Computer. n programmer operating under GEORGE3 on systams for accountancy, storos control, purclinse ordering and power station maintenence scheduling. At least one year's practical experience of COBOL required and Salary within a scale rising from £4194 to £6735 par ennum eccording to qualificetions and

The minimum qualification for this post is A Lavel Mathematics and a degrae or professional qualification would be praferred. Appropriate aubjects would be computing actions, matter ematics, physics, economics, etectrical/electrics.



Central Electricity Generating
Board, Bankaide House, Summer
Street, London SE1 9.U to and by 23rd November 1978.

THE POLYTECHNIC OF CENTRALLONDON

44.44

Circa £8000
The person eppointed will be responsible for the system to Polysachnic's administration and, atter's possible is familiarisation coupled with systems analysis training. It familiarisation coupled with eyatems analysis training. It semiliarisation coupled with eyatems analysis training in superior countryling within the Polysacknic Ideeliy applicants should have a minimum to two Ideeliy applicants should have a minimum to two Ideeliy applicants should have a minimum to two Ideeliy applicants and the ability to communicate with a maponsible stillude and the ability to communicate

LONDON SEI

knowledge of FORTRAN would be an advantage

Applications quoting vacancy number 1478/78/CM is ahould be forwerded to the . Parsonnel Officar (Racrullmant).



South Eastern Region

COBOL PROGRAMMER

CHRIS PRIER Assistant Classifled Manager ...

01-261-8028

Eddie Farral 01-261-8697 Merk Williams 01-261-8018 John Farrar 01-261-8088 Nanette Globs 01-261-8174 Jodie Poole 01-281-8468

MANCHESTER/GLASGOW Owen Kelly 061-872-4211.

BIRMINGHAM/BRISTOL Basil McGowan 021-356-4838

RATES £10 per single column centimetre SERIES DISCOUNTS:

7-19 13-£8

26-£7 52-£5

COMPUTER WEEKLY—Highest requested circulation at a cost per thousand 25% lower than the nearest competitor.

MYRIAD **APPOINTMENTS** LIMITED

Computer Personnel Consultants

. is a small price to pay for an exciting career and £5000.

For the cost of e 'phone call you can have the opportunity to apply your 12 months' COSOL expariance in an installation serving a major British industrial group. Acting as an internal bureau a wide range of applications are handled — from Film Royalties to Material Requirements Planning. You will have the opportunity to become involved at the design stage of system davelopment, and will be trained in FTL6. You should be prepared for considerable contact with users; attending project progress meetings and visiting user

The current hardwere comprises on ICL 1900 mainframe supporting communications links to group users throughout the U.K. end MAXIMOP for on-line program development. A substantial upgrade is envisaged for the neer future and e number of other technical innovations are being considered.

Conveniently located, in MIDDLESEX, for public transport, M3 and M4. the company offer excellent conditions of employment (assisted BUPA, non-contributory pension, paid overtime), a slarting salery up to £5000 with e review after 6 months, and a first-class career. So telephone now to learn more.

24-hour answering service

Please telephone for a confidential discussion or write to: 30 Fleet Street, London EC4Y 1AA

01-353 0981

IBM Systems Programmer CICS/DOS/DLI/VS up to £6000

A Systems Programmer with at least Off of the shave ISM Software is required by a targe manufacturing company situated in

The Company process on their present computes a large variety of batch-oriented systems together with a remote Oate Communications Link. a remote Oale Communications Link.

They are shortly to install an IBM 370/138 with one megabyte of memory as the next stage of their progression within on-line computing. The initial development will be to install a COPICS/DL1/CICS on-line production control system.

on control system. The Systems Programmer will be responsible for advice on and evaluation of manufecturers software onmain-frame and mini-con current needs. This will include the design and writing of in-house soft-ware, database systems, and data

cations software, working ment personnel and user m The ideal applicant will be of Graduate call bre, eged 25 + and have the ability to generate ideas and imple-

Company is expanding and is able to offer really good career prospects, job sails fection and security.

Fringe benefits are excellent and include removal expenses where

Located close to the city centre, the

appropriate:
Applications giving brief personal
and career details 10 Position Number
API ...324 Austin Knight Limited,
35 Peter Streat, Manchester, M2 500. Applications are forwarded to the client concerned, therefore companies to which you are not interested should be listed in a covering letter to the Position Number Supervisor.

AK ADVERTISING

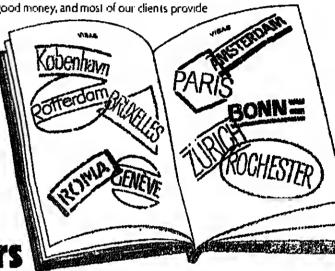
The Knight contractor. As much at home in Rotterdam as Rochester

Knight Computer Services has contracts in Europe, or even further afield

Or in your own area of the UK. If all depends on what you're looking for next, and what your experience proves you can handle.

f you work, abroad, you'll earn good money, and most of our clients provide free return flights and other If you stay in the UK we can

assure you of a high salary and valuable experience that will put another piece in the jigsaw of your career. And, although the length of filine that your contract lasts is flexible, you'll find that we'll go on working for you for years.



Operators European Languages a distInct advantage

UK CONTRACTS

IBM 370/168/158 OS VS1/2 ICL 2960, 70, 80 VME/K DME ICL System 4/70/2 & 50 J&MULTI System HONEYWELL 66/60

IBM Data 100 IBM System 3 & 32 IBM 370/DOS VS (POWER GRASP & CICS) ICLWriters OS & DOS

ICL 2903/4 Ops.

ICL 1900 GII & GII+Ops. **OTHERS** Burroughs, Small & Medium Systems Honeywell Level 60

Controllers

ICL 1900 GIII Ops. & Data

Terminal & Small Systems

Various Contracts For further details or advice on these or other **UK** and **European** Contracts, call Sue Smyth, June Mogg or Jane Asbury, NOW! on 01-491 4706 or 01-439 3411.

Programmers/Analysts

Immediate/Forthcoming Assignments

IBM COBOL OS - SURREY IBM COBOL-CITY IBM COBOL DOS - SURREY CL COROL GII - FAZI, TONDOL BURROUGHS COBOL - SURREY HONEYWELL COBOL - CITY ICL COBOL GII - LONDON IBM COBOL OS & IMS - BEDFORDSHIRE RPGII EXPERT-LONDON

IBM OS SYS PROG-ITALY IBM OS SYS PROG - GERMANY CDC ASSEMBLER - HOLLAND MAINFRAME/MINI FORTRAN - HOLLAND

Minimum 2 years FORTRAN+REALTIME

3 years experience of COBOL. Practical exp. ICL 2980/70/60, Knowledge IBM COBOL. Also IDMS FORTRAN APL PL/1 years les -

Contract to 12 months - BRUSSELS

LUXEMBOURG Please contact Richard Kaluzynski of Sue Gillam: 01-491 4706 or 01-439 3411. All vacancies are open to both male and female applicants.



Knight Computer Services Limited,

14 Old Park Lane, London W1Y 4NL. Staff Services Division of BOC Datasolve Group and R a member of Computing Services Association.



4080

The hottest number in software support

and libraries.

For the team leader's role, you'll

need at least three years' relevant

experience; for the other roles,

less experience is acceptable. Experience with GEC Series 4000

computers will obviously be an

if you like the idea of software

support in a real-time scientific

environment, Tim Swann can teii

you all you need to know-and fix

Why don't you phone him on 01-953 2030, extension 3791.

Alternatively, write to: H.E. Batchelder, Marconl Avionics

Please quote ref.MA 78139.

up a time for an interview.

Among computers designed for development of new systems real-time applications, the GEC software such as utilities, macros 4080 is acquiring aomething of a star reputation. in our opinion, that reputation is wholly justified. We should know-we've just invested over £1 million on aix 4080's to form the basis of a new internal bureau. The installation has a total of 50 tennipals, and provides all the back-up needed by a largeacale software engineering group, working on highly advanced realtime applications.

To maintain and extend the services we offer our "Customer," we now need a number of men and women-at team leader, and more juntior icvels - to maintain, develop and up-date the systems software, with particular emphasis on its . Ltd., Elstree Way, Borehamwood,

You'd also be MARC

No.

THE LIBRARY ASSOCIATION

BIBLIOGRAPHICAL AND INFORMATION SYSTEMS OFFICER

The Library Association Council has approved the creation of a new post in the Association's Secretarial, working directly to the Departy Secretary, of Bibliographical and Information Systems Officer. The post will be responsible for the Association's concents in Indiregraphical standards and bibliographical systems and services, on-line devictionments computer software and hardware developments. Viewdats the creation of a notional found for the discussion of multipressible of systems (including Post Office ospects and costings), co-ordination if the usors - view of liapignally provided satvices, and also to ansure professional invo developments in these pross, a y. Unesco and Council of Europe programmes.

It is expected that the surcessful applicant, who should be a Chertered Ubrarian, will have a wide knowledge of general information systems and solviers, nationally and internationally, and will have sume recent experience of work in on-line systems.

The post afters an exeming apportunity for someone with energy and integination to work at the centre of this

The salary agreed by LA Council is on the Assistant Secretains scale — £5,985 to £7,497 p.e.

Persons interested should apply in writing to the Deputy Secretary's Department, The Library Association, 7 Ridgmount Street, London WC12 7AE, for a detailed job description. The closing data for the receipt of applications will be 12 Decamber, 1978.

AMERICAN EXPRESS INTERNATIONAL BANKING GROUP

SYSTEMS DEVELOPMENT GROUP

MINI-COMPUTER **PROGRAMMERS**

The U.K. Banking Group's Computer Systems Development Programme now requires mini-computer programmers to work on sophisticated real-time TP Systems. The Group is based at our Moorgato Offices using High Level Languages on Honeywell Level 8/43

Provious axportance on this machine is not necessary se training will be provided.

We seek certificates who are of Sonior programmer potential who would like to join a small but expending team.

Selery level: Circa £6,000. Plus all the tringe benefits normally associated with a major

Please apply in writing stating aga and experience to:

A. J. Reynolds

Deputy Personnel Manager, UK Region
American Express I.B.C. b/o.120 Méorgate, London EC2P 2JY



the world's leading expert on

ANALYSTS AND PROGRAMMERS WITH RPG II EXPERIENCE

'When the problem's solved and the system's set up and running, wouldn't you like to be moving on?'

Not much chance of that in most user-companies though, is there? You just have to sit there playing, nursemaid and wondering what onearth you're going to do for excitement next.

But think what it would be like with a really successful, professional software company.

Altergo Business Systems spring immediately to mind. They have hundreds of clients in different industries needing a wide variety of applications -- always new problems and new surroundings.

Quite apart from the constantly renewed challenge they pay very well too. Just show them you are capable, ambitious and experienced on IBM systems such as System 32/34 or System 3.

What can you lose by talking to Altergo? You'll certainly find they can build your career around your circumstances. If you want to travel, fair enough. If not, don't worry

Contact Brian Walker or Barry Whitesman quoting BS/16, of 01-734 9681 or after 8.00 p.m. on 049-481 2713.

Altergo Business Systems Limited, Warwick House, 38 Soho Square, London W1V 5DP.

Services Association

Senior Financial Systems Analyst

The Financial Systems and Development Section at British Gas Headquarters, which is responsible for development and implementation of new accounting systems and new approaches to the problems of financial planning and control, quire a Senior Financial Systems Analyst

Applicants must have; a record of successful schievement in the field of financial systems. The competitive salary reflects the emphasis pleced upon proven technical sbillty in the design and implementation of financial computer systems at a working level. An ability to work with the minimum of supervision and a high degree of selfmotivetion are required for this position.

Formal accounting qualifications, while an advantage, ere not as important as the requisite experience.

The ennual salary range for this position is £8613-£9963 (Inclusive of £456 Inner London Weighting). The commencing salery will be within this range. Please write with full details of ege, qualifications and experience quoting reference F/030501 to the Personnel Manager, British Gas, 59 Bryanston Street, London W.I.A 2AZ. Closing date for spplications

BRITISH GAS

COBOL PROGRAMMERS SCOTLAND, YORKSHIRE AND NORTH WEST.

28th November 1978.

Telephore: Knyterore 52417 of 061-238 9751

TO ADVERTISE YOUR RECRUITMENT

Project Leader

Midlands

c £7,500 A well established international engineering organisation has an opportunity for a Project Leeder to join the systems development group. Candidetes ahould have at least four years experience in the design of commercial epplications, particularly eccounting or manufacturing, and have been responsible for one complete project from feasibility to implementation.

Ability to motivete steff and liaiae with usera is essential.

Excellent salary and large company benefits. Relocation assistance available. Contact: Jlm Baker

Marketing Analysts

London/Manchester c £7,000 + car Our client, a laeding mini-computer systems manufacturer, is introducting a brand new product to the UK market place. The product, developed in the USA, will enhance the excellent range already offered by this company. Marketing centres are being aet-up in London and Manchester. Anelysts, preferably with ICL mini experience and a fisir for marketing, ere required

urgently. Technicel end business awereness are the main criteria.

Excellent career prospects and employment package. Contact: Mlka Creamar

Software Programmers

£4,500 -£7,500 A small but highly successful mini-computer menufacturer beaed in mid-Hertfordshire, has vecencies for several programmers to join their aver growing software development team. This company doubled its turnovar last yesr and is set to do the sema again this year - to over the £4 million mark.

Prospects for advancement to managerial end other senior positions could

hardly be better! Software davelopment experience is not essential for the more junior posts - an interest in a manufecturing environment and e good knowledge of ASSEMBLER level programming is ell that is required. Lenguage and compiler development experience would be useful from applicants for senior

Superb opportunities for ambitious and dedicated technicians.

Contact: Andy Wright

Systems Analyst

A major international drinks firm is installing a new System 34 next Fabrusry, and require a Systems Analyst to join their amoll but vital d.p. department, as soon as possible.

The successful candidate will have full control of all systems, end will obviously be expected to play a major role in the installation. One of the first requirements from the new equipment will be a Management Information System. The Analyst will be completely responsible for this ayatem including designing and implamentation.

A programming background would be useful, RPG II being the main

language, but good systems and business experience is escential. Contact: Andy Wright

Technical Advisers -Minis/Micros

West/North of London to £6,500 + car & bonus Excellent opportunities have arisen with a small husiness aystems manufacturer, for experienced software/commercial support persons to provide liaison and technical eid to a wide ranging customer bese. Cendidates ahould have e minimum of one yeer's implementation or post sales support experience, of amall commercial systems. Since the key function is client liaison, eppointees will be personable individuals with the ability to communicete effectively with technicel managers.

A substantial starting salary will be paid to attract high calibre people. Contact: Margeret Stevens

FORTRAN Programmers

£4.000 to £8.250

DEC PROGRAMMERS

Senior bystems analyst

SENIOR CONSULTANTS

Cambridgeshire

£3.500 to £6.500 Our client, tha research group of e well-known organisation, has immediate vacancies for e number of tachnical programmers, both et junio r and senior

MINI COMPUTER PROGRAMMERS

If you have experience in ASSEMBLER or micro-code or com-

If you have experience in ASSEMBLER or micro-code of communications for all least 11/2 years like a whole exciting field is open to you. We now have opportunities in S.W., N.W. or W. London, Survey, Berts, and Heritordshire for competent people in this rewarding field. The huivre is definitely going to be with the MINI-community professional. Telephone for details.

We now have commercial user organisations and 24 Soliware/Consultancy limit looking for DSC Programmers with 18 months or more experience. Why not may us now and sequire about your chance in improve both salaries and status. BSTS or RT11 experience ove added

LONDON & HOME COUNTIES

LONDON & HOME COUNTIES

CW46/10 Michael

CW46/11 Mighael

CW46/12 Michael

Ideelly, applicents should be graduatee in engineering, mathematics or other scientific disciplines with six months experience of FORTRAN for the junior positions end up to four yeers for the more senior posts.

Salaries are negotiable, with excellent frings benefits, including relocation costs, in a truly professional environment.

Contact: Jim Ba

For further information on any of the above vacancies plesse contact the appropriate consultant. If your qualifications do not match the shove positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants 16 Maddox Street, London W.1. Tel: 01-491 4478

JUNIOR PROGRAMMER

S.E. LONDON

CW46/1 Michael

If you have only just started, as an RPGII programmer, this company will be interested to you. They only require six months experience on System 3. They offer help with relocation expenses and other company perks. You will help them in developing a new order entry and sales ledger system (we also have three companies in the city looking for more expertenced RPGII programmers).

OPERATORS

Do you like bureaux work? Good, then this ICL GII and GIII installation will attract you. 3 shill system and 21 days hole, sign.

CW46/2 Patriole

OPERATORS

OPERATORS

OPERATORS

If you have 18 months IBM OS experience, this complete deminate will be interested in you. They have a 220/18/pigs TP 9/90/pig in teresting 12 hour shift system allows generous lines of Links in the perkelon.

OPERATORS/SENIOR OPERATORS A

To £4,200 ind. A major engineering film (ciferring an excellent tellocation package)
wholes to recruit several (Cil. Cil. of Gill operator). Other top repet to
clude excellent training, 4 weeks hole and rob to E.S., with prospects

OPERATOR 24.700 las.

A 2 shill IBM DOSAVS TRASP system — but right for very thin or a reserve international admirant alters benefit to great about a reserve international admirant religing legislities.

IUNIOR SYSTEMS ANALYST

N.W. LONDON

A major construction company with a small but powerful ICL installa-tion requires a systems analyst with a programming background to work on a variety of commercial and sequesting applications. Nice

CW46/7 Michael

S.E. ENGLAND

JUNIOR PROGRAMMERS

Yog have only I year's commercial experience? Then you are lo great demand: We have a large selection of first-role companies who need paople like you. Some offer mortgage assistance to the right candidales after short period with them:

PROJECT LEADER

UNIVERSAL COMPUTER ASSOCIATES LIMITED Data Express House, 3-Prospect Place, Heathfield Terrace, Chiswick W.4.

Recruitment Consultants

01-995 3883 (01958 6188 EVENINGS)

Three Crucial Dates for Computer Professionals

Haar about the exceptional opportunities wa're offering to

Project Leaders Senior Analysts Analysts

For our exciting new devalopment using mainframe and minicomputars in a distributed processing anvironment, including on-line and data base, we're looking for staff of the most abla and imaginative calibre to guida and support this challenging project, which includes production, marketing and accounting developments.

To make sure we get them - and quickly - we're making three opportunities available to tell you about it informally, in a hospitabla

atmosphere, on whichavar of the occasions indicated below is most convenient for you.

So choose one of the hotels on the appropriate day and come along and haar about the very compatitive salaries and the whole attractive future that goas with them. If you can't make it, please talephone 01-422 3434, ext. 281 and ask for Iain Laa.

CHOOSE FROM:

Eurocrest Hotel Shoppenhangers Lane, Maiden head Sunday 19th November, 11a.m.-5p.m.

The Master Brewer Motel, Hillingdon

Monday 20th November, 12 noon-8.30 p.m.

The Great Northern Hotel, Nr. King's Cross/St. Paneras

Thursday 23rd November, 12 noon-8.30 p.m.

Philips Data Systems

a division of Philips Electronic Industries

offers international opportunities for

Software Development and Support Specialists

Experienced up to £12.000p.a.

Graduates from £6,000p.a.

Philips Data Systems wish to racruit for their Headquarters in Holland, and for their other locations in Holland, France and Germany, experienced Software Engineers and Graduatas in computer science, mathematics and engineering.

Systems Software Designers and Developers

The work involvas specification, developmant and design of naw software products in tha following areas:

- ransaction oriantated operating systems
- Real tima operating systems Data management and data basa management systems
- Deta Communications
- Distributed systems, natwork devalopment. Programming languages, compilar construction

Application Software Experts

- Experts can be assigned to one of the following activitias:
- Invastigation, spacification and Implementation of application software davelopment mathods
- Application rasearch
- Application orientated systems softwara avaluation
- Coordination application packaga davelopment
- Network assignment coordination in customer projects

Support paopla are assigned to tha following

■ Release preparation

- Support of sales organisations through the world
- Problem solving

Experts

- Advising of davelopment department usability
- Pre-sales support : Evaluation of naw products

Software Support

Salarias, of up to £12,000 are nagotiable for experianced candidatas, depending on ability, expartiae and location, and naw Graduates in conduction, mathematics or engineering, can expect starting salarias of £6,000+. All salaries are reviewed ennually. First class benefits include Pension Plan, Health Insurance, and generous assistance with housing and relocation expenses. There are excellent opportunitias for transfars worldwide throughout the Philips Organisation

Applications including a full C.V. and quoting reference IO/c.w. should be sent to John Higgins, Personnel Manager, Philips Data Systems, Elektra House, 2 Bergholt Road, Colchester, Essex CO4 6BE, and applicants should note that initial interviews will be held in the UK, and final interviews in Holland, if required further details concerning these appointments can be obtained from Mr.P.C. Holscher at Apeldoom in Holland on 010 31 65 230 123.



PROGRAMMING CONSULTANT

c £8,000 + Expenses + Benefits

LONDON — NEW YORK — MIDDLE EAST

My client, an international consultancy, has recently secured a contract to build a teleprocessing application for a customer in the Middle East. The system will be based on state of the art mini hardware, and when developed will be installed in New York and Rivadh.

You will already have some exposure to Series I hardware and teleprocessing systems, and be flexible enough to spend several days at a time abroad. Working as one of a three-man team, you will be able to build on your expertise and look forward to a career of truly international flavour.

Call GEOFF MARSH on 01-499 4501 NOW

RW/46/1

AN OPPORTUNITY FOR LOW LEVEL PROGRAMMERS TO BECOME

to £8,000 + Relocation

Young, well-educated Programmers are wanted to develop, augment and modify systems software for one of the world's leading manufacturers. Whether you are already involved in software engineering or are looking for the opportunity to make the transition we want to hear from you. A sample of the projects you could be working on are:

- * Performance evaluation and subsequent tuning of existing systems software.
- * Time critical code in data communications software.
- ★ Operating system development.

Individuals will be expected to demonstrate their ability in identifying problems and in proposing and executing their solution. Successful candidates can look forward to a satisfying career with a manufacturer committed to staying at the forefront of technology.

MY CLIENTS REQUIRE PEOPLE IMMEDIATELY SO CONTACT ME GEOFF MARSH ON 01-499 4501 NOW

hutchinson-scoggins recruitment 47/48 New Bond Street (entrance in Maddox Street) 99 London W1Y OHE Telephone 01-499 4501

Can You Handle A Small/Medium D.P. Installation? Bournemouth

Analyst/Project Leeder ready for your first nanegerial eppointment or alreedy in management looking for the opportunity to widen your experience. Currently we are undertaking a major re-design of our D.P. system to process our Life Assurance business using a new Hewlett-Peckerd 3000 and an on-lina data base approach to systam

Praviously you will have been involved in at least one mejor project from dasign to implementation and used to communicating and dealing with sleff at

You will report directly to Sanior Management and be responsible for the complete production espect of the Oppertment including computer operations,

System design, programming and computar scheduling. You will also be responsible for e staff of len analysts, programmers and operators.

Wa ofter an excallent ramunaration package and in - a highly compatitive selary

generous etail mortgage schame and full elocation expenses

- a non-contributory pension schame including free life and slokness essurance — 25 days' holiday par annum

- excellent cereer prospects with a reel chance of promotion in the luture. If you are seeking a chellanging and rawarding



opportunity write or phone:

Society Limited PO Box 1 2-6 Prince of Wales Road Bournemouth BH4 9HD Tel: 0202 767655 Ext. 208

The Certified Diploma in Accounting and Finance

thequalification in accounting and finance for all non-accountants

Telephone 01-636 2967 for full

MID GLAMORGAN COUNTY **County Treasurer's Department**

SYSTEMS ANALYST

(Commarciai Project Taam)

SYSTEMS ANALYST

(Borough Council Project Team)

Salaries £4245-£5568

experience and ere negotiable. The authority currently operates en ICL 19045 computer and is now actively planning for the introduction of en ICL 2972 computer next

A minimum of one year's systems experience is desirable or applicants must hold a suitable qualification. A lisxible working hours scheme is currently operating

The County Council's echams for the payment of lodging and disturbance allowances and ramovel expenses will apply.

NATIONAL CONDITIONS OF SERVICE Application forms (to be raturned by t Dec. '78) are obtainable from the County Traesurer, Mid Glemorgan County Council, County Hell, Carditi.

CANVASSING WILL DISOUALIFY.

HIGHLAND HEALTH BOARD TREASURER'S DEPARTMENT

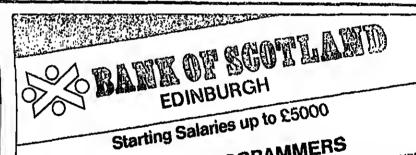
ANALYST/PROGRAMMER Salary Socie: £4,421-£5,326

Applications are invited for the above post in the Computer Services Unit which is stuated in the grounds of Hilton A total day

The current workload oncompasses a veriety of financial and medical applications which is processed on an ICL 2904

Applicants should have at least two years relayant experience and be conversed with ICL Cobol and Soltwere.

Application leans and further particulars may be obtained from and should be returned to the Personnel Officer, Highland Heelth Board, Resy House, 17 Old Edinburgh Road; Inverness, IV2 3HG, not later than 24th November, 1978.



ANALYST PROGRAMMERS We are looking for competent Programmers with a minimum of one year's experience in either COBOL or Assembler. Experience in deeign end experience in either cobol or Assembler as would femiliarity with DL 1

experience in either COHOL or Assembler. Experience in deelign enconspection would be edvantageous, as would femiliarity with DL1. The ability to work within a team is essential.

Our Project Development Department is ectively involved in a number of demanding applications, both batch and on-line instructions that Our Project Development Department is ectively involved in e null of demanding applications, both batch and on-line, including the development of a new Branch Terminal Network.

SYSTEMS PROGRAMMERS

We are keen to augment our existing Systems Programming expertise We are keen to augment our existing systems Programming experti-by racrutting a tachnicely ekilful Programmer, Experience with IBM herdware under VS1 or MVS ie essential, while femiliarity with

As part of the technical support function, the Systems Programming Assembles Would be an adventage.

Department's work includes. system generation and maintanance

- evaluation and installation of software package.
- development of general purpose software.
- support for on-line system davelopment using IMS end SNA

The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Services Division of the Bank Offers altrective
The Computer Division of the Bank Offers altrective
The Computer Division of the Bank Offers altrective
The Computer Division of the Bank Offers altrective

Please write or telephone for an application form to:

Mrs M. C. Pinkerton, Assistant Staff Controller, Bank of Scotland, Liefts Avenue, Edinburgh EH11 197 Bank of Scotland, 2488 (Ext. 188)

Telecommunications in ICI

Data Communications Engineer Holland

An experienced Data Communications Engineer is required to be based in Holland. He/she will plan and co-ordinate the implementation of data communication networks for ICI throughout Europe.

The person appointed will assist consultants to specify the data network requirements in detail and be responsible for engine ening these projects into operational services. This includes responsibility for scheduling and co-ordinating the installation and commissioning of the various equipments associated with the data networks throughout Europe.

The Lechnical education required is at least City & Guilds Technicians Certificate in Telecommunications with several years practical expenence ol planning commissioning or maintaining data networks.

A knowledge of other European languages is desirable. Salary level 50-54,000 DFI. Please write or telephone for an application form to:



S. D. Kemp. Senior Personnel Officer, ICI Head Office Services Dept, P.O. Box 3, Fulshaw Hall, Wilmslow, Cheshire SK9 1QB. Tel: Alderley Edge 582828 Ext 5238.

Senior **ComputerOperator** with large systems experience

Southampton

£3824+20% shift allowance

Associated Container Transportation Services Ltd. operates world-wide through container services on behalf of five major shipping lines. Racently wa have installed a B6700 computer with an on-line Databasa system to supplement and eventually replace our existing Honeywall

We now require a Senior Operator to work with both of these installations.

If the chellenge of such a position appeals to you, and you have obtained a couple of years lerge systems axperience, preferably with Burroughs equipment, we should like to hear

from you. The post is based in our modern air-conditioned offices in Southempton and relocation expenses will be paid where appropriate

The Compeny offers, in addition to the salery, an attractive range of fringe benefits.



Please writs or telephone for an application form to: Mrs. L. Lisney Assistant Personnel Officer, ACT Services Ltd., Richmond House, ferminus Terrace, Southempton. Tel: (0703) 34433

Junior Commercial Programmer West Country

An opportunity has arisen within the Plessey Marine Research Unit, Templecombe,

We are looking for a suitably experienced man or woman to join a small software team we ste boaring for a suitably experienced man or woman to join a small software team involved in a variety of accounting and engineering support projects. With at least 1 year's expenience, you should be self motivated and keep to develop new skills. Knowledge of FILETAB/FTL6 and GEORGE 11t would be useful, but familiarity with any high level language would be acceptable. A competitive salary will be negotiated in line with experience and qualifications. Generous assistance will be given with relocation expenses, temporary lodging and

Please telephone or write, giving brief career details, to Stuart Carter, Personnel Menager, Pleasey Manna Research Unit, Wilkinthroop House, Templecombe, Somersel. Tel: Templecombe (09637) 551.



T.I. Bainbridge Silencers Ltd.

Data Processing Manager c. £8,500, plus car

T. I, Beinbridge Silencers Limited is the lergest menufacturer and distributor of replacement exhausts in the UK, engloying over 800 people, with a sales harmover in excess of £20m. If consists of two manufactuting plents, two major warehouses ambi-UK -wide network of seventeen subsidimy

Localed et Atherton in Lancoshire Ilio company currently run a vacially all computer System 32 or sunday installation in real time systems for slock control, invoicing and seles ledger. The systems apparate on a veriety of computing resources, including n-house minis, bureou sarvines and time shering on Other maintranns.

In order to retionalise and enhance their computer capacity the company are developng a new distributed dota processing system — evenue for hulling advancement. to link their factories, depots and waruhouses, which will eventually entirely replece the existing systems.

In order to continue this development and build up the new computer department life company wish to appoint a Oata Processing Menager, Reporting directly to the Orrector/ General Manager, the Oate Processing

Manager will be letally responsible for the amplementation of the new systems implication that recruitment and training of compater staff Applicants, aged 30 - 35, should be graduate

or have an equivalent professional qualificaturn. They much have had at least eight years ranta precisessing experimnce with two years in the committeened of a medium sized IBM operations. They should have sound know-Indige of stock control, prefuction control and from read systems and experienceine distributive trade would be an adventage. This is are exciting opportunity to develope now system which will be in the forefrontal existing feeling dogy and thereis a clear

Salary will be negotiable around £8,500 per onnum, a company car will be provided. thurn is a contributory pension scheme and the usual range of large company benehis For an application form men and women as invited to write or telephone in confidence to Geoffrey Laycack at the address below (telephone 01-229 6742) quoting reference 593.

Urwick Dynamics Limited S Monmouth Rosd London WZ 4UT Computer and Selection Consultants

Computer System Manager

To megogo a migr-compagni installation contribute 321 MXI computer with initially 256K Bytes of reamony, multiple Discs. multiple VDU's, Lim: Printer, Paper Tapic Big order and Princh, and a

Rosponsibilines will include instructing users in the developing of Fortren and Assembler programs, implimentation of system program up-date; and planning and uxeration of system expansion

Applicants, men or wenner, must have experience in penerating RTE opmaling systems. A degraph computer stateme would be a

Sugaldy qualified and exponenced conditions are invited to tolophone or wall to: G. A. Batts, Occo Reder Lid., Davis Road, Chassington, Sarray, KT91TB.

DECCA * In Open of the Control of th

Programme

Offshore Oil Industry

Hayes, Middlesex

Vetco Offehore Limited, e well established international company application engineering eervicas and equipment to the offshora exploretion and product industry, is installing an IBM System 34 linked to a US mainframe and an additional account. an additional programmar.

Reporting to the Suparvisor, Systems Group, successful candidates must be at least three years experience of COBOL programming, preferably manufacturing environment, and be able to work with the minimum supervisors.

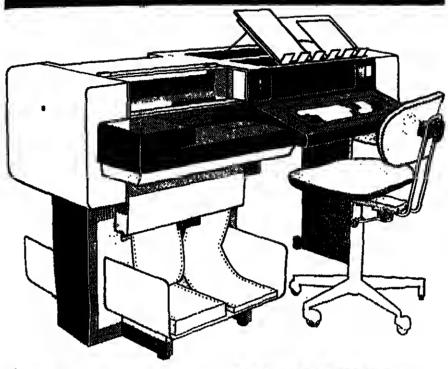
In addition to an excallent starting salary, banefits include four weeks not be plus eight statutory days per annum and occupational pension and pensi

Please telephone of write to Irle Faulknar, Vetco Offshora Limited, Ventura House, 72-74 Station Road, Hayes, Middx. Tel: 01-579 7733.



SYSTEMS ANALYSTS ANALYST PROGRAMMERS **PROGRAMMERS**

good reasons why you should join



5 OPPORTUNITY

.from within.

We are a computer company. It is

therefore logical to conclude that our

best computer people move apwards

into management and other high level

positions much more guickly than in

any other environment. We promote

6 FRINGE BENEFITS

Pension and disability scheme.

holiday. Modern clean offices.

club. Free car park.

Subsidised centeen. Four weeks

Good working conditions. Social

Flexible working hoors, BUPA

-COME AND TALK-

If you have at least 6 months Office

Computer, Mini-Computer or

Mainframe experience we would

like to meet you to discuss what we

can offer you and what you can

offer us.

ACT NOW!

l'elephone David Cullis, our.

National Software Manager

application form, if you are

for a short chat and an

MONEY

YOU COULD EARN UP TO (8,500

We pay a generous basic salary and substantial bonus (no upper limit) based on ability and effort. In addition, we also pay ear/travel allowances to our software people.

2 SYSTEMS

WORK OM A VARIETY OF APPLICATIONS We are not an in-house computer operation. We provide software apport to 700 + elients across the U.K. In providing support for these cliems, you will work on a wide sariety of commercial applications and increase your business systems knowledge and experience extremely

3 MACHINE RANGES NCREASE YOUR TECHNICAL EXPERIENCE

We support four ranges of compiner. As a Manufacturer, we mently release new equipment to keep pace with technology and the demands of the market place. You will be trained to support more than one range of machine.

4 FIELDWORK MEET OUR USERS

Yuu will work closely with high level client representatives during project development and implementation at their Offices and nurs. These are not desk bound jobs.

Computers

charge (UK ONLY) or simply pur the coupon in the coupon in

PERMANENT **ESSEX**

Systems Programmer c. £7k

Our Client is a major user of IBM kit operating under OS and is currently looking for a complete Systems Programmer to work on current TP davalopments and future projects. Numerous larga company banefits including e car allowance are offered. Ring now for a quick assassment of your chances.

Programmers

If you have at least two years' Assembler experience and like working in green belt country, then do not hesitate to take advantage of this challenging position. Get in on the ground floor of tha fast expanding mini/micro market nowl

Programmers

to £5k

If you have only 18 months' experience in COBOL and/or PLAN end want to embark on a very interesting caraer path with e large organisation that is stable but dynamic, and in addition if you wish to cut commuting costs while at the same time benefiting from good in-house training, then phone immediately for details.

Analyst Programmers

If you have IBM-COBOL or BAL or PL1 and would like to work for a large company with a vary interesting hardware configuration, and era keen to become involved with advanced development projects, then our Client would be very interested in hearing from you now. Several worthwhile benefits ara offared with this attractiva

Systems Programmer

If you are not interested in commuting to London but interested in working in chearful surroundings in South Essax, this could be an ideal opportunity for you. If you are really good at DOS POWER-VS end wish to move to higher management later, than phone us now.

LONDON Systems Analyst

If you have good systems experience with on IBM background and also have a knowledge of PL1 or Assembler and some Database expertise, this could be an ideal opportunity for anhancing your career prospects. Our Cliant is mainly involved in the Import/Export business and is located in the City. Get in touch immediately for further datails.

Programmer

c. £6k

Our Client, a large retail chain situated in W.1, is seeking a competent person to develop and enhance their current system which is run by an ICL 2903 using COBOL. Should you be interested in taking advantage of this excellent opportunity, please get in touch immediately.

Technical Analyst Programmer c.£6k

Our Client, an angineering company in W.C.1, is looking for a person with an IBM 370 background to help develop new systems and anhance already existing ones. If you heve good FORTRAN exparience backed by some BAL, then phone now and improva your future prospects.

Analyst Programmer

Our Client, a large multi-national Petro-Chemical concarn, is aeaking a highly motivated parson with good IBM 370 COBOL experience backed by some CICS expartise. Should you feel qualified for this vary interesting position which hes excellent future prospects than now is the time to take advi Telephone now, press your luckl

Programmer

Neg

A challenging opportunity exists for a Burroughs COBOL Support Progremmer to work within a Bureau environment. The work is varied and in return an attractive

For these and many more rewarding positione get in touch now with John McLean

BRENTWOOD (0277) 212021



Or write to him at LINSCOTT COMPUTER SYSTEMS LIMITED, P.O. 74, BRENT-WOOD, ESSEX CM 15 OBZ



TENNING FITT PRODUCTION AND A WAR FITS SUPPORT III/MINE CATORITINA CALL TO THE STATE OF THE 机砂碗的复数形式 有情感的 经证券 医甲状腺素

CONTRACT DIVISION

BENELU

ISM OS ASSEMBLER
IBM SERIES I ASSEMBLER
IBMI 3790 EXP PROG
PDP FORTRAN KN OF FRENCH
PDP MACROII RSXIIM
SEN ANALYSTS KN OF EITHER
FR/GER/DUTCH
ANALYSTS KN OF EITHER
FR/GER/DUTCH
, C, DOI 0,1

X	
HOLLAND	£370
HOLLAND	£375
HOLLAND	£375
BRUSSELS	£375
HOLLAND	£330

FRANCE £ EX RATE

IBM ANALYST PROGRAMMER		
COBOL/PL/I OR ASSEMBLER		
KN OF FRENCH/GERMAN		
OR DUTCH	FRANCE	£ EX RATE
IBM PROGRAMMER : ASSEMBLER/		~ -X 11A1E
COBOL/OR PL/I KN OF		
FRENCH/GERMAN OR DUTCH	FRANCE	£ EX ATE
IBM JUNIOR PROGRAMMER		
ASSEMBLER/COBOL OR PL/I		
KN OF FRENCH/GERMAN		

FRANCE £ EX RATE **CONTRACT DIVISION**

SINGER SYST 10 ASSEMBLER SYSTEMS PROG DOS/VS CICS

IMS OS COBOL PROG/ANALYST IMB OS COBOL/ASSEM PROGS IBM OS TSO COBOL AN/PROGB IBM DOS/VS COBOL/ASSEM IBM AN/PROG OB COBOL IBM 8YS 3 380/370 RPGII

IRELAND	£220 + p.w.
CITY	£250 p.w.
CITY	£240 p.w.
BEDB	£220 p.w.
KENT	£240 p.w.
BEDB	C200 m
	£200 p.w.
HERTS	£200 p.w.
C. LONDON	£220 p.w.
VARIOUS	£200 p.w.
N. I ONDON	6100

LONDO	N& HON	ME COUNTIES		
IRELAND	£220 + p.w.	ICL 2903/1900 COBOL PROJ LDR EXP		
CITY	£250 p.w.	ICL 2960 VMEB/K AN/PROGS TEAM LDR PDP BASIC COMPILER	C. LONDON C. LONDON	£220 p.w. £250 p.w.
CITY BEDB KENT	£240 p.w. £220 p.w. £240 p.w.	PDP MACROII + CORAL PDP CORAL/ALGOL/ASBEM	HERTS Herts	£250 p.w. £220 p.w.
BEDB HERTS C. LONDON	£200 p.w. £200 p.w.	COMPILER EXP BURR \$700 COBOL	HERTS Surrey	£220 p.w. £200 p.w.
VARIOUS N. LONDON	£220 p.w. £200 p.w. £190 p.w.	IBM 370 RPGII + COBOL PDP BASIC + RSTS/E 1900 + IBM EXP. AN/PROG. TSO	BUCKS N. LONDON	£220 p.w. £220 p.w.
	-	EXP PREF 1900 COBOL GII	HERTS C. LONDON	£200 p.w. £190 p.w.

AS A SUCCESSFUL INTERNATIONAL RECRUITMENT AND CONTRACT ORGANISATION WE HAVE CONSIDERABLE EXPERIENCE IN ASSISTING COMPANIES IN INDUSTRY AND COMMERCE THROUGHOUT THE UK AND EUROPE CALL YOUR NEAREST K.P.S.L. OFFICE AND DISCUBS THE MANY OPPORTUNITIES AVAILABLE TO YOU

Scrvices Association

Ring Chrietine Kay/Dave Hayton 734 0152/6 (24 hours), 27 Noel Street, W.1

Offices: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

Computer Personnel NEW YORK

£8,000-£13,000 per annum.

Our Client, Computer Technicians Incorporated Systems Division, a U.S. based consulting firm has opportunities for Programmers and Systems Personnel to join a major U.S. bank, located in the Wall Street area of New York City. Programmers—minimum of 3 years

Programme Analysts - minimum of 3 years

Systems Analysts/Programmers Senior Systems Analysis.

These permanent positions offer the opportunity to gain substantial experience in a sophisticated environment. Candidates who must have a knowledge of I.B.M. and/or N.C.R. systems should apply in writing, with a full curriculum vitae to:

C/o PARC, P.O. Box 834, Wrights Lane, Kensington, London W8 BSR: Tel: 01-937 824) 101

1900 and System 4 **COBOL Programmers Develop your career into Training**

Our Training Division in Windsor needs Programmers with 2-3 years' experience of 1900 or 5ystem 4 COBOL to help meet the needs of our growing business in 1979 Read on If you would like a change from applications coding and a move into

leaching what you know to our customers and staff. The job offers:- training in communication and presentation techniques.

continuous development of your own

technical expartise. career paths to 2900 range.

starting salaries between £4,500 and £6,500 depending on experience.

courses around the UK and overseas

pleasant rural working environment, with a host of recreational facilities. relocation assistance where

Teaching others and meeting new people, whilst Increasing your rown knowledge and experience, can be immensely rewarding. For more information and an application form, phone Mike Perkin on Windsor 68181 ext 253 or write to him quoting reference CW1088, to ICL, 8eaumont, Old Windsor, Berks 5L4 2JP.

International Computers

think computers - Ihink ICL

ICL

SALOP COUNTY COUNCIL

FRANCE £ EX RATE

PROJECT LEADER (TECHNICAL SUPPORT)

Applications are invited from experienced and Programmers to lead the Technical Support consisting of softwers end date spacialists training appropriate to the needs of the in be given, experience of at least three of a green would be desirable VM and CMS POWER/VS and RJE, DL/1, PL/1, Clo nonitors and en anquiry package. salisfying this requirement, but wife experience in these grees will be condide graded poets.

The Council, at present, operates a growing terminal natwork and substitute of a growing terminal natwork and substitute of a growing terminal natwork. menta are schaduled. Davaloph nteractive informetion system is be this post will play a major part by pre-appropriate and cost affective software.

Talaphona Mr. G. Matthews on Silvation for further details and an application The County Treasurer, Salop County Treasurer, Salop County Classics Shrawsbury, Salop SY2 6

BLACK & DECKER

Maidenhead

Systems Analysts to £7,500

Berkshire Programmers to £6,500

Major new developments in data processing create the need to recruit a small number of top class systems development staff. These appointments will be based at the company's UK headquarters in Maidenhead, Berkshire.

The opportunities are truly outstanding and will involve major systems development in the key areas of manufacturing, distribution, service and finance. In technical terms advanced hardware and software (including database) will be utilised, and the systems will be inter-active and extend the links to all the United Kingdom locations.

Additionally, there will be projects involving the European operations of the company.

THE COMPANY

Black and Decker is a highly successful world-wide company with an impressive growth record. In recent years the sales and profits growth of the company has been outstanding increasing three-fold in the last five years even through times of major economic difficulties.

In the UK the company has 3 manufacturing units, 2 in the South, at Maidenhead and Heathrow, and a third at Spennymoor in Co. Durham, together with 26 high street service centres.

THE VACANCIES

The opportunities are outstanding but not unnaturally the requirements are very demanding.

SYSTEMS ANALYSTS

A good educational background, preferably with university or professional qualification. In dp terms you should have a number of years systems experience and in depth knowledge in the manufacturing, distribution or financial areas.

PROGRAMMERS

In addition to first class educational qualifications good practical programming experience is required. This will involve a number of years using COBOL in a commercial environment. Experience of real time applications an advantage.

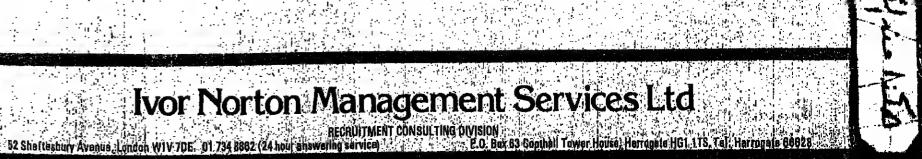
THE PROSPECTS

Progression within the company is based on merit and with a policy of Internal promotion and with the company's growth record there are always opportunities for good people.

Development plans will provide the successful candidates with a very clear promotion path within data processing. However, our client would also like to think that the people recruited by this campaign will be able to make their mark not only in dp but in general line management in due course.

TO APPLY

Please write in the first instance to Ivor Norton at either of the addresses below giving full career details. Initial interviews will be held at convenient centres throughout the UK.



PILKINGTON (S) ST. HELENS





NEED

SENIOR SYSTEMS ANALYSTS **ANALYST/PROGRAMMERS** SENIOR PROGRAMMERS TECHNICAL SUPPORT PROGRAMMER

OFFER

- 1. IBM 370/158 facility (in-Compeny). 2. On-line and database applications
- (increasingly). 3. Distributed processing (remotely).
- 4. Excellent fringe benefits (invitingly).
- 5. A competitive salary (naturally!).

We are recruiting for Pilkington Brothers a major International Group of manufacturing companies with their headquarters based in St Holens, Morsoysido. The Data Processing Centralis a group function providing services to their UK and overseas companies

They ere currently utilising en IBM 370/158 under OS/VS with on-line and databasa systems using CICS and DL1. You will be involved in their expansion of Database and On-line applications combined with a move towards distributed processing.

Mejor application plens currently under way cover all ereas of business systems including computerised systems for an edvanced technology manufacturing plant. You will receive excallant formal and practical training combined with real cereer opportunities.

Ideally candidates should have a minimum of 2 years' experience which should include ASSEMBLER for the Technical Support Programmer.

CONTACT: David Wada on 061-833 0427 or 0785 58013 after 7.00 p.m. or et

ADDRESS: Freepoat, Blackfrlars House, The Parsonage, Manchaster.



nd communication, self motivated and with piolest der experience in varied DP background for in-PROG/ANALYST ... Two years expenence with RPG2 for client in machine root industry, IBM S3 mod, 15d installation. To 65K PROGRAMMEN! Devon Experience of 2 years of PL/1 for this 370/148 in

COMPUTECH 01-794 0202

same should be aged between 28 and 36, and have a mini

Applicants should be aging pervelon 28 and 36, and heave a maintain all levels in years depending in order for youth organizational capabilities related in documentation processing and information handling in the world of handling and or lineage was offer an etimetries humanical package. This contribute while such a followmentation conscious programment of an experience of activery bushall and for the right porson could represent a long-term project.

Ref. 84:31178

The door contract apply in the lirst interact to The Oversees Routelment Consultant Howard Organisation International Limited Employment Business Section 8 Eletree Way, Borelien Wood, Mertiordehiro 7st. 01-933 408

BURROUGHS L.9000 OPERATOR

Required for leading West London Auctionoers and Estate Agents based in W.12. Selery negoti-

Please contact Willmotts, 01-773 444. Ref. TMHM for further details.

SALES SUPPORT PROGRAMMER

GEC Compulare Limited opacialises in the design and marketing of odvanced computer cyclems for real-time octentific, industrial and commercial applications. The Technical Morketing Department provides Technical Support to the Sales Engineers, onelyoes the customers' requirements and prepares proposeds on how to meet these requirements utilizing the

The Department ruos e large GEC 4000 Computer System end n major part of the jeb lavelyee the development of damonotrationo, running of bench-mork leats and making presentations to propped to

We are eacking a person (mole or lemelo) who hee some tomilistly with Operating Systems and who wishes to use this knowledge to demonstrate the range of coftware produced by us. Experience in programming is escential, and candidates should have a knowledge of more than one programming language.

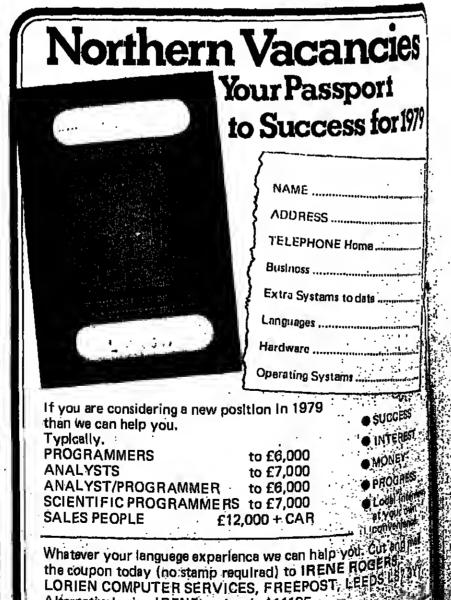
We offer an Interesting and demnnding cereer. The colories and friege banetite are those normally ecoccioted with a large

Those interested choold opply by telephone or in writing to: Mrc. E. Harrington, Personnal Cepartment, GEC Computero, United, Elotrae Woy, Borehamwood, Herio, Telephone: 01-953 2030 Ext. 3587.

GEC COMPUTERS LIMITED

- :

SEC



Alternatively ring IRENE on Leeda 444185.

OCS House,

Servia Road, Leeds LS7 1NJ Telephone 0532 444185

LORIEN COMPUTER SERVICES

Manchester M3 8BB

EXPERIENCE?

then consider

OPERATIONS SUPPORT

in Croydon

£4,500 to £5,500

Are you currently e senior operator or shift leader with three years operating experience gained in en

Then if so, here is the ideal off-shift position for you. A lerge internetional company successfully instelled earlier thia year an IBM 370 meintrame in e purpose. bulli data centre in Croydon, Running under DOS/VS and POWER/VS both betch end on-line work is

Our clients wish to recruit a luriher member for their operations support team. The work will be veried and interesting, involving procedures, acheduling, controlling various aspects of the operations erea. end close liaison with the Systems and Programming

In eddition to a good atert selary, benefits include a non-contributory pension end free life assurence. The company is well known to us here at Capp Associatea end we heve no hesitation in recommending the friendly working environment to Interested applicents.

For further deteils contact our CROYDON office quoting ref: CW 48-BS.

CAPP ASSOCIATES 56 Computing Services Association



Dreaming of pastures new?

Systems Analysts and Programmers:

Your dreams could become reality at Ansty. Which is where Rolls-Royce Industrial

& Marine Division is, in a truly rural situation. Our business is adapting famous aeroengines to non aero applications. We are part of a revolution offering high efficiency, compact power plants to industrial operations and world navies.

Commercial success in such high technology relies on effective and comprehensive management systems. Our Systems Department has to react quickly to constantly changing demands. Which is why we need reinforcements and why — in our dynamic team-you'd have the challenge of close involvement in new projects and the satisfaction of

devising your own solution to a variety of problems

Programmingisin COBOL. Equipment is

ICL 1900 with hardware replacement strategy currently under review. User input is via VDU's which also provide on-line enquiries to daily updated files. The installation is operated 7 days per week around the clock.

We want people at all levels. If your experience is limited, we'll train you - if you can prove your basic ability. Your salary will be competitive, related to your performance and constantly under review. Overtime is paid.

There are plenty of pleasant places to live nearby—in Warwickshire and sout Leicestershire. Generous relocation expenses where appropriate:

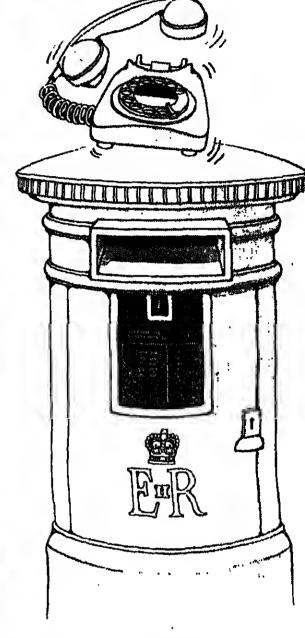
Don't just dream about fresh woods and pastures new. Spring into action! -

Phone (reverse charges) or write for an application form to Mrs K Brown, Personnel Administration Manager,

Rolls-Royce Limited, Industrial & Marine Division.

POBox 72, Ansty Coventry, CV7 9JR. Tel: Coventry (STD 0203) 613211, ext 60.

Means toanend



You want a better job.

We want you for some of the best computer jobs around.

So how do we get together? The choice is yours. Phone Andy Mogg now on

01-491 4706

or send the coupon,

Knight Computer Services Limited,

Telephone: 01-491 4706. Please send me an application form.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

ANALYSTS

SUSSEX

Neg. c £7000

To complete the heevy schedule of development streedy underwey our client must now augment their teem by the addition of two experienced Systems Analysis.

The position will ollar opportunities for project leadership and control and the design of computerised systems using the most advanced techniques end herdware

Applicants for the positions should heve a sound O.P. beckground with around two years systems an elysis involvement. The company offer a competitive selery negotiable depending on experienca, together with the banefits associated with a large organisation.

SYSTEMS ANALYST and PROGRAMMERS

SOUTH HERTS

TO £6600 Our clien, one of the country's leeding retellers is currently developing an extensive range of

new systams.

If you would lika:

- To receive treining in advenced ICL softwere
 Develop COBOL programs in an on-line environment
 Involvement with Point of Sele terminels and word processors
- * Staff discounts on company products * Generous holiday antitlemen

—and you have a minimum 18 months' COBOL programming and for enalysis experience. then this could be the opportunity to establish yoursell in a secure and progressive installation

PROGRAMMERS IN SURREY

Why commute for first-class opportunities and

PROGRAMMERS possessing 2 years + experience of COBOL in IBM Assembler, with an interest in career development should consuler the hist class opportunities available with one client based in N.E. Surrey who ollers

- * Latest I&M Equipment including Lishr Printer
- * Comprehensive Training Database & Teleprocessing
- * Excellent Cereer Prospocis * Sports end Social Club (Free Stall Restaurent)
- * Superb Benefits Package wurth c £1000

The date processing departments development plans will continue well into the eighties and programmers joining the compeny now can expect n variuif and interesting future. Starting salary is commensurate with experience and additional handlits include lloxitime, paid overtime, modern working conditions and an excellent relocation package

NEW SYSTEMS

WEST MIDOLESEX

£4500-£7000

Analysts and Programmers

With the expension of our clients development section, ideal opportunities now exist for Anelysts end Anelyst / Programmers.

The successful applicants will enjoy working in a stimulating and highly professions anvironment and contribute extensively in the implementation of the company's luture O.P. projects offering Analysts complete involvement and Programmers exposure to advanced softwere techniques and inter-active programming.

A sound knowledge of general commercial applications gained in a modium size installation plus two years' progremming and/or systems experience cuvering program design and implementation ere prime requirements.

The company is a large organisation offering a secure luture and career progression in addition to ell the usuel large compeny benelits.

24-hour answering service Please telephone for a confidential discussion or write to:

30 Fleet Street London EC4Y IAA

_ 01-353 098

SHIFT **LEADER**

required by the London Date Centre, Hemmersmith

Remuneration package of £5;000-£5,700 including shift allowance and production bonus. In eddition there are ample opportunities for overtime.

Dua to continued expansion e Shift Laader is now required for our Univac 90/60 running both betch processing and on-line syetems, operating over three shifts, five days e week.

The successful candidate, who should have OS4 experience, will lead a small shift team with ample opportunity to demonstr**ete initiative and leadership qualities**

In addition to the remuneration package we offer ganerous. discounts on Compeny merchandise, together with pension and sickness benefits and excallent holidays.

The London Date Centre is an associate Company of Top Shop and Top Man (members of the Burton Group), two of the most successful retail chains in the U.K.

This is an excellent opportunity to join e small professional Company in a congenial working etmosphere end you would be adviced to cell Geoff Griffin without delay to discuss the

LONDON DATA CENTRE

275/281 King Street, Hammersmith W.6. Tel: 01-748 8986

the second of the second of the second of the second

CONTRACTS

At least 2 years' OPERATIONS experience?

If you are a freelance operator now, or intend to go forelance in the near future contact us for details of our current and luture assignments in all areas of the U.K. The ability to communicate and an intelligent attitude towards freelance works considered essential.

IMMEDIATE

ICL SYSTEM 4 J 1800 OPERATORS ICL G2+ OPERATORS (ALSO PART-TIME) ICL 2903 TECHNICAL SUPPORT **ICL 2903 OPERATORS ICL 2900 VMEB OPERATORS** IBM OS VS1 OPERATORS **OSJCL WRITERS NCR CENTURY OPERATORS** DDE/PUNCH/VDU OPERATORS

FORTHCOMING

IBM OS VS1 OPERATORS ICL SYSTEM 4 J 1800 OPERATORS ICL 2904 OPERATORS ICLG2+ OPERATORS **ICL G3 OPERATORS** ICL VMEB/K OPERATORS ICL VMEB SHIFT LEADER **DATA CONTROL CLERKS** HONEYWELL GCOS OPS (ALSO PART-TIME) 24 hour etc.

* MANY WELL-PAID PERMANENT JOBS * * PHONE OUR PERM TEAM FOR DETAILS * We pey excellent rates (and expenses) to our Contractors

PHONE 01-439 6481 (24-hour answaring service) for more information



Morgan Guaranty Trust Company of New York

OPERATIONS ANALYST - 370 DOS/VS LONDON up to £6,000

- * Low interest mortgege fecility
- ★ Non-contributory peneion plen
 ★ Free medicel and life insurance plene
- * Profit ehering
- * Subsidieed meals
- * Subsidleed travel

If you ere already working in an operations support role, then this job is for you.

You will be responsible for the efficiency and productivity of the machine area, but an equelly lerge part of the job involves trouble shooting of releted problems. Ideally we would like you to have a thorough understanding of DOS/VS concepts and facilities; knowledge of POWER/VS or CICS/VS would be an advantage.

There are nine new systems to be implemented over the next six months. PLUS major upgrades to the existing duplex mainfreme configuration.

Opportunities for job satisfection end career progression are excellent, while a comprehensive training plan may also be of interest.

PHONE NEIL ARMSTRONG on 01-603 7335



hilomation Processing People

58 Pembroke Road, London W8. Telephone: 0f-603 7335/6. Telex. 261298 Computer Services & Recruitment Consultants



Programmers and Senior Programmers for Manchester and Surrey

Systems Oesigners Limited is en Independent British systems consultancy, becked by the NEB, end with en unrivalled reputetion in mini and micro computer epplications, Established in 1969 and currently 150 strong, the company is expending its operations in both the UK and abroad.

A full order book and continued demends for our high cuelly service have produced an immediate requirement for a number of professional programmers and systems. engineers for our Menchester and Cambariay (Surrey) officee.

Current projects are challenging and rewarding and the company policy of full participation of all members offers broad prospects and opportunities for repid progress for top peopls.

Requirements exist for people with broad experience in the design and implementation of mini and micro computer systems using both essembler and high level languages. We are interested in beging essembler end high laval lengueges. We are interested in hearing from programmere and senior programmers with at least two years' experience. Applicents must have good acedemic qualifications end a proven software ability \ logether with a professional outlook.

Please write to or telephone SYSTEMS OF SIGNERS LIMITED et

MANCHESTER Mike Srey EH House Voodlende Road Altinehem, Cheshire WA14 1 HG el: Manchester (OB1) \$28 9305

CAMBERLEY. Bill Hockey Systems House 1 Pambroke Sreadway Camberley, Surrey CU15 3XH : Tel. Cambadey (0276) 82244

M. J. HALE ASSOCIATES LTD. FREELANCERS - NAME YOUR PRICE **WE PAY OUTRAGEOUS SALARIES**

Systems Design + Coral or similar Honeywell Cobol

ICL/IBM Cobol

MANY OTHER VACANCIES SO GIVE US A RING AND YOU'LL GET THE BEST DEAL AROUND. CALL ALAN HOWARTH ON 0279 25068

FORTRAN .

FOR THE BEST JOBS IN THE SCIENTIFIC AND TECHNICAL COMPUTING FIELD -**CONTACT US NOW**

Asspecialist egents in the Engineering. Scientific and Technical industry we now deal with over 4,000 companies throughout the U.K. There is an urgent demand from these companies for experienced and Graduato programmers with FORTRAN experience. Jobs from £3,500 to £8,000 l'eleas. Phone us now lor a free liei ol vacencia:

Capital Appointments, 28 Windmill Street, Landon W 1 Tal: 01-837 5661 |day| — 01-636 8859 |avae. 1

OPERATIONS MANAGEMENT C £7000

Essex - very urgen

N Landor



if you're currently working in a fairly senior capacity in Operations (e.g. in a supervisory or menagerial position), these vacencies which have arisen through Whitbreed's continuing expension end development could present an outstanding opportunity for you:-

MANAGER FOR LONDON CENTRE

Raporting to the DataCantre Managar, will take direct reaponsibility for operations etaff and generally ansure the amouth and afficient running of the department.

MANAGER FOR NEW DATACENTRE

To be based initially at our London Cantra. Ha/she will be the key figure in setting up our brand-naw Centre et Luton (recruitment, machinea, on-aita problams, co-ordination. etc.), and after this initial period will assume full responsibility for Computer Operations staff at tha new Centra.

Both these vacancies represent exceptional opportunities. We are looking for sound professional d.p. experience and ability in man management, with the accord on injuictive and obtential.

In return wa'll offer reaponability, ganuine promotion prospects within the Whitbread Group

Ring Fenni at SBS on 01-734 (853. Sho'll tail you more about Whitbread, the jobs themselves, and discuss your prospects with us.

SCIENTIFIC & BUSINESS SYSTEMS LTD 29-31.0XFORD.STREET; LONDON WIR TRE

With anything can happen... to Cobol Programmers

Before

I used to feel like this chap looks. I worked hard, long hours, and I lacked reward, motivation, a professional environment and the opportunity to enjoy life.

There we were, the other lads and lasses and me, with 11 yrs.-3 yrs. COBOL experience on lots of different machines, reasonable competence and hoping to Improve ourselves. No chancel



After

We saw this ad. for Commercial-Union. I talked to Capp, they told me about the job and all these benefits -

- ★ Salary £4,250-£5,250 ★ 370 COBOL OS/VS1, ROSCOE
- ★ Free lunches
- ★ 33½ hour, flexitime week ★ Preferential mortgage (5%)
- * Excellent relocation package ★ Low cost pension and
- Ilfe assurance ★ Good training

So I went for an Interview, loined them and as you can see what I'm looking forward to ...



So ring CAPP ASSOCIATES today quoting ref: CW 45-8J and start as soon as possible. Enjoy the benefits of CU living!



CAPP ASSOCIATES Computing Services LONDON AND MANCHESTER

HEAD OFFICE: 01-686 9693 (24 HOUR ANSAPHONE 19 PARK STREET, CROYDON CR9 17 NORTHERN OFFICE: 061 236 9085 (24 HOUR ANSAPHONE) FAULKNER HOUSE, FAULKNER STREET, MANCHESTERMI 4YD

Software Specialists

NEED RECOGNITION AND REWARD!

OUR SOFTWARE SPECIALISTS GET BOTH BECAUSE THEY

OWN

WE NEED YOU because the major manufacturers of Europe need us to develop commercial applications for their small business systems.

Their problems include development of hardware, operating systems, languages, APPLICATION PACKAGES, marketing of existing products and new products based upon microprocessor technology.

Holland Automation provides THEM with the complete solution...



You are a programmer able to discuss and design solutions for clients and then implement them cause your experience includes assembler and have level languages together with a sound understanding of the commercial applications of small ness systems.

Your present company provides you with a government baseful down salary, a car and a package of benefits - bu really distribute all of the profit entite employees?

Holland Automation does both to provide the complete solution.

Ring and ask for lan McEwan who will pr with information, assess your exper immediately arrange an interview.

Holland Automation international (UK) Ltd. 459 Bath Road Slough SL1 6AA Tel: 06286-65232

Morgan Guaranty Trust Company of New York

SHIFT LEADER c. £5,500

LONDON IBM 370 DOS/VS

OPERATOR c.£4.700

SHIFT LEADER

* 4 yeers' 370 DOS/VS experience

★ JCL knowledge
 ★ Experience of CICS and/or POWER/VS.

- * Low interest mortgage fecility
- Non-contributory pension plan
 Free medical and life insurence plens
- * Profit shering ★ Subsidised meale ★ Subsidised trevel

OPERATOR

- ★ 2 yeers 37D DOS/VS experience
- Basic knowledge of JCL preferred
 Baeic knowledge of CICS end/or POWER/VS

In eddition to the above, the following may also be relevent:

- * exciting hardwera upgrades to existing twin meintreme configuration within the next six months.
- * Monday to Friday shift system, effording two extended weekends out of three
- * good cereer opportunities within pre-determined treining peths

PHONE NEIL ARMSTRONG on 01-603 7335



Information Processing Facilie

58 Pembrake Road, London W6. Telephone 01-603 7335 / 6. Telex. 261298

ANALYSTS/

PROGRAMMERS

South Coast

Up to £5,800

Our client, an international leader in digital communicatione systems, is looking for Analysts/Programmers with at least three years' experience in computer systems. They will be required to develop software, to diagnose faults "on line" within the hardware and digital computer systeme which contain a large number of specialised peripherals. If you have a hardware/ software background, our client would be particularly interested in hearing from you. Our client's offices are based on a beautiful parl of the South Coast where moderately priced housing is available. The Company offers a superb re-location package, and a career structure tailored to ault your specific expertise. In the first instance, please ring John Nolan or Barbera Compton on 01-584-8476 or write quoting ref TE.24

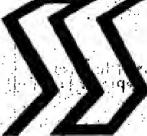
Thurloe Executive Special Projects Division

4/18 Harrington Gardens, London SW7 Telephone 01-584 8476

COMPUTER **PROGRAMMER**

SYSTEMS ANALYST UP TO £7 1/2 K

B. L. T. Parker, Administration Manager
BARCLAYS UNICORN GROUP



to score with this coupon!

For the better jobs in the North & Midlands, clip the coupon (or phone) NOW!

Home Tel No Current position Salary.

Sampson Staff 16 Piccaelly, Mandiester MT 11.7



ARE YOU LOOKING FOR SALES MANAGEMENT?

One of the Major Computer Manufacturers is looking for 2 experienced medium / large systems sales people, who have reached Senior Sales Executive or Junior Sales Management status, but are now ready for the next step.

You will be given responsibility for very large existing and new accounts, where you can expect to sell £2 MILLION to £20 MILLION systems.

The rewards are high. A guaranteed income of approx. £11,000 in the first year, plus bonus, which will give earnings of £14,000 to £15,000 per annum, but could be much more.

They want people who are mature, clear thinkers, sound business negotiators able to operate at all levels.

Excellent career structure, real management opportunities, etc., etc., exciting possibilities abroad.

If this interests you, please 'phone or write to the Senior Consultant quoting CW 177.



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ Tel: 486 5644



SALES EXECUTIVES— -NORTHERN ENGLAND CAN YOU REALISTICALLY EARN £15,000?

If you can sell, and have been successful selling small/medium business systams, this is a REAL OPPORTUNITY to join e Major Computer

REALISTIC TARGETS not ficticious ones.

REAL EARNINGS not promises.

Achieve targats and you will earn £12,000 BUT most are earning £15,000

REAL PROMOTIONAL OPPORTUNITIES

PROFESSIONAL SUPPORT to help you achieve SUCCESS

This company, one of the most successful, is looking for Sales Executives who want to join in thet success, make real money and advance thair cales.

Please 'phone or write to the Sanior Consultant, quoting ref. no. CW 178.



INSIGHT MARKETING & PERSONNEL CONSULTANTS LIMITED 72-75 MARYLEBONE HIGH STREET LONDON WIM 4AJ Tel: 486 5644

BRANCH SALES MANAGER £14K-£16K plus car

SOUTH LONDON AND HOME COUNTIES

Exciting opportunity to join a very successful, fast growing International Mini Computer Manufacturer, well established in the U.K.

If you know smell / madium systams, and can show a good track racord, this

Excellent base salary, non-returnebla guarantee, manegement bonus, plus company cer, giving £14,000 p.a. Brench Menager avarage earnings this

You will ba Sales Manager for South London and ell Homa Counties South

Pleese contect the Senior Consultent. Ref. No. CW 182

SENIOR SALES EXECUTIVES - MINIS

UP TO £17,000 + CAR THROUGHOUT U.K.

How would you like £10,000 guarantaed with commission on top, plus

- ★ Most Salasmen ara earning £17,000.
- * Rapid growth to management from within
- ★ Last year over 40% growth, this year again over 40%
- ★ Good refaranca sells, good support, good products

Get out of the rut and get rewards for your efforts.

Pleese contect the Senior Consultant.

Ref. No. CW 183



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON W1M 4AJ TEL: 486 5644



SALES MANAGEMENT—NATIONAL ACCOUNTS

c. £15,000 p.a. +++

Have you sold £1/2 million systems (or larger)? Can you sell at very senior levels?

Can you manage large sales campaigns?

Can you manage and grow existing large installations?

Would you like a Sales Management position, and the prospects of an excellent career with a Major International Computer Manufacturer?

The money is excellent. You will earn approx. £15,000 p.a. with prospects for much more. First year guarantees are made up of base salary and non-returnable guarantees equalling £10K-£12K. Commission / bonus paid in addition.

This is a superb opportunity to join a professional company at management level, who look after their people.

Please telephone the Senior Consultant quoting Ref. No. CW 180



INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD. 72-75 MARYLEBONE HIGH STREET LONDON WIM 4AJ TEL: 486 5644





TODAY

FOR A BETTER

TOMORROW

SEE PAGE 47

Digital System Design **Aviation Division**

of Smiths Industries

require

2 Engineers

Having two or more years experience with

*Airborne Computer Software

*Real Time Computer Operation

*Failure Survivai Techniques

For work on the design of

New Flight Control Systems.

Reply quoting Ref.FCR to Mr. H. Upson,

SMITHS INDUSTRIES LIMITED Bishops Cleeve, CHELTENHAM

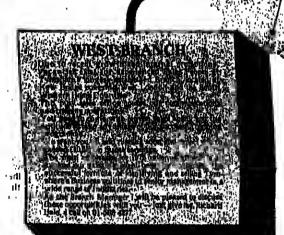
MYRIAD

SALES EXECUTIVES

Tymshare UK is a leading US Bureau epecialising in the solution of complex business problems. The Company market error of proverful coftwere products almed to giving senior management direct access to accurate up-to-the-minute the plants making the vital decision process a quicker and surer one.

Typically entered the market-place in 1966 and have grown to a Company over 2,500 personnel, running the stately 60 maintages with a turnover of \$150 million. The Company have sales and service offices throughout. And they the United Kindley Warren Europe and Japan. They have developed sophisticated opplication software that company in the Company have sales and runication system. That II integranks as the most proven network in the commercial computer services that it.

the been operated in the Life for years and have already achieved an enviable track record having the state of the life and the life of th





NORTH BRANCH

Applicants should have a minimum of 2 years' sales experience, gained ideally with oither n hordware manufacturer, bureau organisation or with suppliers of office computers. Due to the unique nature of the eyetems involved, exionsive training in the Company's product is onvisaged, together with the opportunity to move into the nurketing of applications systems. Successful condidates will receive an excellent basic salery, with potential to archieve carnings well in excess of £10,000 per year, car sesistance and excellent conditions of employment.

To discuss the company and vacancies in greater detail contact Tymahare's consultants:

Myriad Appointments Limited 30 Fleet Street, London EC4Y 1AA



Freelance **Programmers**

We have IBM 370 Mainfromes and will pay etilective rates for programmers with a minimum of lour years' programming experience, at least a year of which is on IBM-380/37D equipment using COBOL under DOS or DDS/

If you have the relevant experience and would be interested. in a long-term contract in the Northern Home Countles area then contect us.

Wilte to BOX No. CW12

Box Na. replies "MARKED PRIVATE AND CON-FIDENTIAL" to: D. C. Madden, Personnel Manager, Group Personnel Services, John Laing and Son Limited, Page Street, Mar Hill London NW7.2ER WORCS - GLOS - WILTS DORSET **AVON - SOMERSET - DEVON**

To £8k +

A wide renge of vacancies exists from Progremmer to Systeme Dealgner in the ebave counties (25 + elone in Gloe.). The equipment in use is elso varied. It includes ICL 1900 and 2900 eeries, IBM 370, DG NOVA, PDP-11, Honeywell and Veirien. The lenguages vary from COBOL to ASSEMBLER to PLAN to PL-1 to Beald in short there just ign't enough room to tell you shout them all. Should you already live or wish to relocate to this expanding part of the world, then urgently prone Bristol (0272) 42863.1

Hertfordshirs County Council

MID-HERTS/BOREHAM WOOD COLLEGE Dapartment of Computing. Science & Tachnology

LECTURER 1

for Programming (COBOL and BASIC) and Business Data Processing

Sound commercial ex-perience needed, preleiobly, with teacher treining or ex-

Partiline applicants elso wal-comed Further information and application form from the Pringipal Battee Way, Bots an wood Hers

new position in our test in injensoring section. In injensoring section. The job involves working with designates of beta Commo-squipment at all stages of development from conception, into pilot production. You will be required be available methods of system test shift design/program nuternationally design/pr ITT Business Systems

Il Electronics Engineer doesn't inpose a wide innough term to cover your career interest, then you may consider the lobowing new position in our test ingineering section. The job involves working with desirated of bate Commo-



So how do you get your name and ambitions in front of the people who can

offer you the chances you never see? There's no great secret, no inside knowledge just post the coupon below.

Over 3,000 ettractive employers - big companies and small - tell us about their steffing opportunities. When you post the coupon below, we send you a concise application form to be completed end returned.

Give us ell the relevant deteils about yourself, your career, your ambitions end those compenies you would not like to work for . . . these facts will be treeted as highly confidential. They will also be compared to our clients' personnel requirements end every time they metch - you'll be

shortlisted for e key job, one which has probably never been edvertised. And our clients will contact you direct. Sofrom the comfort of your own armchair you can prepare your own case for a better deal, and then wait to heer

directly from a company which thinks you're worth it.

Quick, efficient, end free. Thousands of people heve already used Lansdowns. Some of them have

edvertised. Lanedowne Appointmente Regieter, Deelgn House, The Mell, London W66LS, Tal: 01-579 2282 (24 hour answering service).

lilled the jobs that you didn't see

BOROUGH OF TORBAY

Analyst/Programmer

Salery grade SO 1/2 (salary range £5232

The authority currently hee an IBM 370/115 running under OS/Vs with CICS and emphasis is now being placed on the development of local and remote beingcessing. The successful candidate will have live years minimum experience in developing computor applications, preferably in the local government environment. Applicants with practical experience in any of the following will have some adventages: PL/1. RPGII. Assemblar. TP (preferably CICS).

Assistance may be given with housing accommodation

removel expenses, etc., in appropriate circumstances.

Candidates must diectose any relotionship to a member or officer of the Torbey Council. Canvassing

Applications should include name, address, aga, qualifications, present and pravious employments, and the names and addresses of two referees, and be sent to the Borough Tressurer, Town Hell, Torquey, by 27th November, 1978.

Treasurer's Department

to £6060 p.e.)

Senior Systems

Data

Processing

Manager

South East

The Mall, London WS SLS, Tel: 01-578 228

A major engineering company in South East England, msnufacturing equipment for the outomotive industry, have a vacancy for a Data Processing Manager to head a department providing a comprehensive data processing

Service.
The position involves responsibility for the day to day
The position involves responsibility for the day to day

The position involves responsibility for the day to-day operation of the computer and punch rooms, computer systems and programming and the design and implementation of new systems. In an expanding company.

The successiul randidate is likely to have a high standard of general education, a sound knowledge of manufacturing systems and experience of RPG II and system analysis with IBM System 3. Equally important is the ability to communicate at all levels and to lietse with near departments.

ser departments.
Salary is negotiable up to £7,500, dependent on qualifications and experience, plus other benefits associated with a forward looking company.
Please write, in strictest confidence, with sufficient career details to eliminate the need for an application form to Steve Guesford, MCS/ROBERTSON & SCOTT (ADVERTISING) LIMITED, Acom House, 314-320 Gray's Inn Road, London WCIX 8BN, quoting reference number G124 and liethed is a covering letter any companies to

G124 and listing in a covering letter any comp whom your application should not be sent.

Our clients are keen to meet men and women, aged 20 to 40 years, with potential earnings of between £4000 and £8000 p.s.

Robertson Offices in London, Manichester, Glasgow, Edinburgh, Aberdeen, Darlington, Henford, Offices & affiliates worldwide.

& Scott Recruitment Advertising • Search • Selection.

Internal Auditor (Computer)

Salary £6300-£6750 (based at Reading) The use of computing at Thames Water is explaining Currently we operate twin IBM 370/148's which support a large teleprocessing network and an ICL 1904S providing a service which includes on-line programming. There are also vertices agency and commercial bursoux arrangements.

We require an Internal Auditor to join the Computer Auditor in cerrying out the full range of computer audi ectivities. In particular, you will be involved in the review of neward existing computer systems. The examination of the computer operation and the socurity of the Authority's computer installations. You will be based at Reading and will be expected to visit the various offices within the Authority.

Candidates (male or lamele) should have algorificant asperience of linencial computer systems and the ability to criticise constructively and communicate

Benelits include a casual car allowence (subject to review), generous holideys, stell canteen, good social

Applications, giving the names of two referees, to the Director of Finance, Thamas Water Authority, Nugent House, Vestern Road, Reading, Borks RG1 BDB by 1st December, 1978.

Thames Water

Computer Department Post 1

ON THE SOUTH DEVON COAST

Essential: RPG II, IBM 32 or System 3 experience and good French. Desirable: IBM Assembler or

Successful applicant will subsequently be trained in Sonas 1 and PL/1 and must be prepared to travel.

Post 2

Essentist: PI/1
Ossireble: Series 1 or IBM 3B0/370, Assembler,
Systems programming experience,
Good French, Probably some travel Conditions for both posts: Selery £5000 + . Good issue. Subsidised restaurent.

Please contact: Mr. H, Spelgelhetter, Region-el Personnel Mensger, 4B Wimpole Street, London WIM 7DG. Telephone 01-486 7828

AMERICAN MEDICAL (EUROPE) LIMITED

Programmers and Analysts

Enots manufacture e wide renge of pneumetic control equipment compression and pueh-in tube fittings in a factory located in pleasant rural Steffordshira.

The Compeny are developing e wide range of applications in the areas of Seles Order Processing, Production Control, and Finance using on-line and telecommunications techniques.

Applications are invited from suitably qualified people, who have experience in these areas.

Personnel Manager, Enots Limited, P.O. Box 22, Eastern Avanue, Lighfield, Staffs, Tel, Lighfield 54161.



COMPUTER ENGINEERING PACKAGES SALES

C. LONDON ENEGOTIABLE

A immula opportunity his einsen with one of our major clickets for a person with embilion and seles field to tale on the challenge of selling existing anglisering software products and personnel new brokucts.

You must be aware of market possibilities and the methods of essenting positivity mathets; be gifte to ages a sales dupte and work towards a solventing in promotional methods and relevant takes kieratign. It is lob hydrog requisit review of products being sold, and recommendation of editions to the range.

Applicants must be Engineering Gredularies both appearance in an engineering (computer appearance of an engineering open solventing appearance of a posterior appointed by the appearance of a posterior appearance of the engineering appeara



... IF IT'S NOT STRETCHING YOU TOO FAR.

ARBAT is a total success above of Birlish Computing
Real Time Banking and Communications Systems are controlled sound careers in Programming
Real Time Banking and Communications Systems are controlled sound careers in Programming
User and International Projects in a mich way and Low-rifled sound careers in Programming
Systems

ARBAT is a total success above of Birlish Computing
Real Time Banking and Communications Systems are controlled sound careers in Programming

ARBAT is a total success above of Birlish Computing

Real Time Banking and Communications Systems are controlled sound careers in Programming

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

ARBAT is a total success above of Birlish Computing

A

initially London based then oversens opportunities - Salanes are by negotiation and wells.

a reputation of boing top payers - Reviews are at least twice in year one-Waoffercontain All ARBAT jobs are TASK chentallod-and career progression is on merit and from with

Want to hear more about the other benchts- We will sent I you a proble on ARBAT-and areas. interviews locally-Phone or winto NOW to discuss the opportunities with-

Morns Hogg at ARBAT (UK) Lid 160 Ougen Victoria St. London, EC4V404 Office No 01-248 6499

> Inner London Education Authorit

South East London Colq Lewisham Way, London SE4 IUT

JUNIOR PUNCE

A junior punch/companyon for is required to wod ann

188m currently using 1.7
4 100 computing systems
ortucational saver-

Although no previouser: 5 caperience is required, 2, 7

should passess a good and of Emplish and be a "

undertako goneraloko: Salary within the tell 12998-£3748 incluses

Fritms, rejumable wit 21

from the Deputy Service Officer Tel V

COMPUTER

PROGRAMMER

STRATION

The poste will involve progression to both mere preference of europe from University Administrator in Honography Maniput (Progression of the Progression of

COMPUTER **OPERATOR**

Operations Staff

Suddenly it pays to support British industry



Kidsgrove, Stevenage and Letchworth £3000-£6000

Britain's own computer company, ICL, is to clay big international business. The 2900 computer range has not only helped to consolidate the Crumpany's position as the number one computer company in Europe, it has also contributed to the rapid development of worldwide markets. Suddenly, it makes sense to work in operations with one of Britain's rechnological leaders. By joining us now you could be involved in the

most exciting operations stene in Britain. We operate from two large data centres at Letchworth and Stevenage utilising a total of five large 1900 • systems plus a number of key 2900-hased centres.

The Iransition to the new hardware demands extensive high-calibre operational and systems

We need experienced professionals, both to support present hardware and to push through full ransition to 2900. If you have proven experience in some of the following areas we would like to meel you. 2900 training is available in all cases.

- 1900-2900 Hardware
- Plan/COBOL HardwarePlanning
- UserSupportFunctions
- Systems Design
- Operating System George 3-VME/B . On-line Systems Development
- Performance Measurement
- Project Control

Support British computer for hardogy. It could make a rewarding difference to your career. Ring Bill Unit on Stevenage (04 88) 3 361 ext 696 or write to him, quoting reference CW 1084, at ICL, Cavendish Road, Stevenage, Heris SG1 2DY.



UNIVERSITY OF

SERVICE

manage used of allocation of resources

manage used of allocation of resources

manage used of allocation of resources

manage use of ellocation of resources. The Computing Service operates a dual processor ICL 2970, and a PDF 11/45, and in addition makes extensive ass of remote computing Sectities. There is a substantial and growing provision of interactive computing and communications development. The initial leaks will include extending researce control to include an extensive range of penphanal equipment, and the development of charging manhanisms for computer usage.

The past is in the programming grade (Salary range 12384-18585 p e.j. The starting salary will depend on qualifications and experience. Applicants should

RECRUITMENT SERVICE

EAST ANGLIA day? Look for a job in rural East Anglie way, hustle and bustle of city life.

SEN. SYST. ANALYST (IBM)

ANAL./PROGRAMMERS (COBOL)

PROGRAMMERS (COBOL 8/A

SYST. ANALYST (ICL) CHIEF PROGRAMMER (IBM)

Use UK Constitutor Dept. is widoning its programme of cost-effective thistogram with IBM 370 hardware and during the next two years this wid include new systems and termines lacilities at several manufacturing site a working classify with its usern we'd like to hear from you.

iwo paopie, praierebly with,

you would fixe to find out more, including details of sieff bonus. Rhame, relocation expenses and mortgage assistance, cell, Stieft. Sicknell on Byffeet 41181, or write to him at Van Laer House.

Following a group decision to centralise computer hardware, an IBM 370/158 computer has been installed at Group Headquarters and Is replacing the on-site machine. To fully exploit the potential of this new machine and to meet the system requirements of our business well into the 80's we are now engaged upon the development of an exciting new generation of systems. The systems, which will embrace Sales, Mannfacturing and Financial Spheres of the Company's operations, will utilise advanced Database and Real-time techniques.

are now running on its local ICL installation.

of Companies In the automotive component industry. It is comprised of several subsidiaries, both in the U.K. and Overseas. Continual expansion has resulted from successful business performance over 11 long period. The group is itself part of Turner and Newall Limited — a major world-wide organism ton with interests in the Engineering, Plastics,

Construction and Automotive Industries The company is well sited at Slough in Berkshire, within easy commuting distance of pleasant rural areas as well as being close to London. Over a number of years the Company has developed

Sales Order Processing

The team working on this new IMS DB/DC Rear-time Database System are currently involved in proliminary system design work for the Slongh division of the company. The project has recently been expanded to cover a further division based in Wales and Henrel Hempstend. and the associated preliminary systems investigation and design work will begin shortly. Detailed systems design work will commence before the end of 1978 and continue

through 1979.
Additional enthusiastic Analyst/Programmers are needed to become involved at all levels of design, programming, user training and implementation

Manufacturing Systems

Database Administration

in order to react more quickly to variations in customer demand, a fully integrated Manufacturing System is currently being fleveloped to include inventory Control, Accounting, Material Requirement, Capacity Planning, and Demand Planning to provide an interface with the Sales Order Processing System. These systems will be supported by tMS Databases covering Bill of Materials Routing and Manufacturing/Purchase Orders. This significant development represents a complete revision of our development represents a complete revision of our Production Control System and consequently provides a valuable opportunity to Join a team controlling multimplementing a mujor reorganisation, We require Senior Analysi/Programmers to assist with the design and implementation of these application systems. They will be working clusely with users in developing operational procedures and interfaces within the departments covered

DATA BASE 370/158

Finished Goods Inventory Control

A Finished Goods Inventory Control System is being developed, interfacing with the Manufacturing and Sales Order Processing Systems, to meet the needs of three unit companies within the group. The system will encompass all areas of Inventory Control including Stock Recording, Forecasting, Replenishment Plumping, Perpetual Inventory and Stock Analysis. This complex and sophisticated system, utilising database and providing extensive Real-time facilities using a Ferranti mini computer haked to the mainframe in Manchester, is scheduled for completion inwards the end of next year. We are now engaged upon the preliminary system design phase and engaged upon the preliminary system design phase and talented, hard working Analyst/Programmers are required to participate in the detailed design, programming and ementation phoses.

Financial Systems

The Project Team is responsible for the design and a implementation of Integrated Accounting Systems which will interface with new Sales Order Processing and Mandacturing Systems Aspects entrently being worked on are Fixed Assess the live this month) and a comprehensive Management Sales and Demand Statistics System. Due live early next year. Other Systems, at the entilest stages of planning and design include Nominal Ledger, Purchase Ledger, Puyroll and Sales Ledger. These systems will use IMS DB/DC database and online real-time techniques, and are to be implemented towards the end of 1979.

The Company offer an interesting technical environment, devaloping programa on-lino using DB/DC softwore. Appliconts should have a mature outlook, and be keen to accept responsibility; the emphasis being on the ability to join and develop as nembers of a Project Team, rather than specific

Five weeks holiday, a subsidised canteen, relocation expenses (if necessary), and an excellent starting alary make these positions extremely attractive If you are interested in discussing your aultability, contact our Recruitment Consultant.

Engineering Components Ltd.

We are a newly established centralised function with three main responsibilities — database development, application project, tenm support and IMS technical functions. Database development involves inng and short term planning design (including security and integrity of data) and implementation of database, together with the control of access to dain and the co-ordination of action to implement changes. Application Project Team Support includes initial consultancy on the approach to be used in a database environment, optimisation of database call sequence lincheding modelling with Diproportype) and assistance with tMS problems in lesting. IMS technical functions cover a wide range of activities such as recovery and restart procedures, performance monitoring, reorganisation, unload/reload, tMS support, etc.

Myriad Appointments Limited 30 Fleet Street, London EC4Y 1AA 01-353 09g1

RPG/COBOL Analyst/Programmers up to £4900

ICL's Marketing Division Includes a small team engaged on designing and implementing the company's marketing planning systems and an explosion process similar to OOMP, to be run on our own on-site 290-l.

We are looking for RPG/CO8OL Analyst/ Programmers with experience ranging from 6 months

If you are looking for a challenging position with a major manufacture, good prospects and excellent working conditions, then we would like to hear

the state of the s

Slough, Berks Please phone Karen Holmes, Principal Peisonnel Officeron Slough 31111, or write to her at ICL, Computer House, 294/29g High Street, Slough, Berks, Please quote reference CW1083.



SOUTHAMPTON COMPUTING

normally possess a degma, have pro-gramming experience and a keen inter-est in administrative and control pre-parations.

Essex
For details of these and other vacation is printed and in the second other vacation in the second Further particulars may be obtained from Mys. 2. Yaughan Smith, The University Southeniston SCO SN H. 1. 16 school applications should be sent by 1 December, 1975. Pleaset write and 1034/A/CM.

VAN LEER (U.K.) LIMITED

∱member of a mejor international Group of Co किंदु manufacture and devolutionant al

INDUSTRIAL PACKAGING

Analyst/Programmer £5,100-£5,900 Cobol Programmer £4,500-£5,100

tomal qualdicehone in Computer Science
a tackground of linencial and commercial systoms with a manulac

DOS IVS. CICS and Div | experience

IBM Teleprocessing Projects at Southampton

Experienced IBM Programmers and Analyst Programmers £4800-£6200

At our new air-conditioned Headquarters in Southampton we run an IBM 14g ond IBM 158 (the latter to be replaced shortly by an IBM 3032) operating, under OS/VSI. We plan to link around 400 terminals distributed throughout

Programmers and Analyst Programmers with over 3 years' experience of IBM Systems using COBOL or PL/I are required for new teleprocessing development projects using CICS and DL/I, On-line source program maintenance is carried out using ROSCOE.

Benefits include generous holidays, flexitime, a subaldised staff restaurant,

For an application form please telephone our 24-hour answering service — quoting reference number P109.

PHONE: (0703) 31818

SOUTHERNGAS



Experienced Analysis and Starting Salary up to £5,200 p.a.

The County Council currently operate a 2 The County Counted currently operate a 2 magabyte IBM 3707148 Computer. We have a number of vacancies in our systems development seption and if you have at least two years analysis and/or programming experience (preferably on IBM equipment); we would be interested in hearing from you.

Cheshirs County Council is a leading local authority in the computer light, and is currently developing a number of warted and technically advanced projects. If you would welcome an appoint of the computing caret ring Mike. Waiter on Cheslar 802138 or alternatively writer out of

Write to US #1

Systems Control Section, Computing Services

Division, Cheshire County Council, County Hall,
Chesler

SALES EXECUTIVES STRAIGHT IRONWARE

LONDON AND THE SOUTH EAST £12,000 + AND COMPANY CAR

> TO SELL AN EXCELLENT RANGE OF V.D.U. AND TELEPRINTER TERMINALS **COMPATIBLE WITH MOST MAIN FRAMES, VERY COMPETITIVELY PRICED** AND READILY AVAILABLE

Our Clients are one of the leading manufacturers of computer peripheral equipment in the world. Their excellent range includes highly competitive VDU and teleprinter equipment which sells very well because of their PRICE, RELIABILITY and AVAILABILITY. These fast moving products are sold both to the end user and OEM markets and require little or no systems involvement.

If you are an established "straight ironware" salesman and identify with the sort of products sold by companies such as ITT, MEMOREX, OLIVETTI, KODE, CASE, CREED, HARRIS, etc., then we have something very interesting to discuss. If you do not have this experience but feel your background equips you to sell successfully in this fast moving market place then we would be equally keen to meet you.

TELEPHONE BOB BOWER A.S.A.P. TO ARRANGE A MEETING. DO IT SOON, YOU HAVE NOTHING TO LOSE AND A GREAT DEAL TO GAIN!

HUTTON EXECUTIVE SELECTION LTD. HUTTON HOUSE, **HUTTON STREET, LONDON EC4Y 8HR**

TELEPHONE: 01-3537141 (24 HOURS)



any background preferred plus experience of PROGRAMMER

COMPUTE CIT OF TO 1 OZO2

Staffordshire Araa Heelth Authority

NORTH STAFFORDSHIRE HEALTH

COMPUTER STATISTICIAN

islary will mittally be on the scale £4421-£5326 p.a with prospects

Mr. A. M. Neth, Director of Computing Services North Staffs Royal Infirmery Princes Roed, Hertshill, Stoke-on-Trans Td. 0782 49144, ext. 4840

Senior Project **Leaders:** Come to Croydon with Real Time Mini for up to £8.5k

Plus generous reiocation expenses if moving your job means

Plus ample opportunities for European travei.

Plus promotion prospects as bright, if not brighter, than aimost anywhere else - If only because this Company is all kinds of communication systems, all big.

Once ensconced in Croydon, your future is very rosy, and could include anything, communicationswise, anywhere in the U.K. or Europe, the Company is that well thought of.

Project lesdership OR communications OR good (what other kind is there) Real Time Minl/Micro experience, plus an appropriate degree is what you need.

For further details dial 01-836 9719 or 9882 and ask for Beryl



Computer Appointments (Real Time Mini's Place) Suite 43, 12-13 Henrietta Street.

> Burroughs Computer Operator

The International Systems Division of American Express based in Brighton is seeking an experienced Burroughs Operator for its B.1860 which is used to support systems development

A successful candidate will have upwards of 12 months experience on a Burroughs prepared to work on a 5 day 2 shift system. Write, giving brief details or phone for an application form to: Dennis Perfrement, Central Personnel

Brighton, Tel; (0273): 693555 ext. 6512.

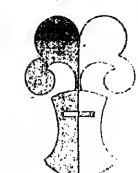
MERICAL DERES

OPERATORS O

All Grades

Cassos in reserve

Cassos



CONTRACTS MIDLANDS & N. ENGLAND

IBM

PL/1 PROGRAMMERS c. £220 Midlende, North Weet, Brietol COBOL PROGRAMMERS . C.£220 Scotland, North West IMS PL/1 PROGRAMMERS C.£230 Midlands, North West CICS ASSEMBLER PORGRAM-MERS C. £245

CICS OL/1 PROGRAMMERS Midlands c. £245

ICL

1900 PLAN PROGRAMMERS 2960 VMEB/FORTRAN PROGRAM-North West

1900 GII/III COBOL Programmers Midlends, North West, Scotland



OTHERS

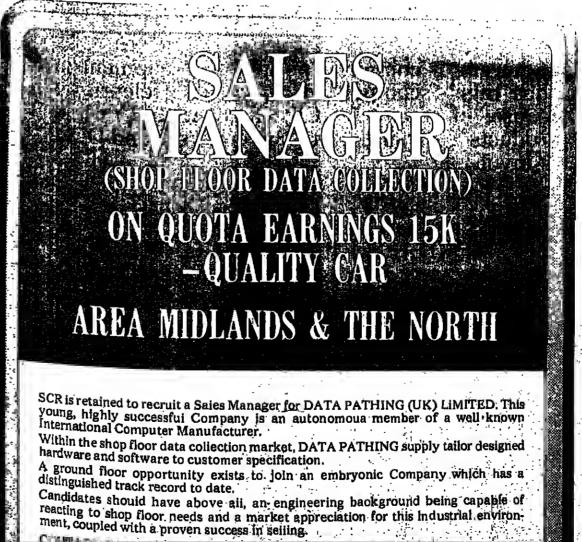
HW L66 IOS/TDS PROGRAMMERS North West C. £250 HW L66 GCOS/COBOL PROGRAM-MERS C.£225 Yorkehire, North West, Midlands HW L66 COBOL PROGRAMMERS Scotland C. £220 POP DIBOL PROGRAMMERS North West C. £220 POP RSXII PROGRAMMERS Midlende, North West .. C. £230



PERRY BUTLER ON 061-833 9341/

Knight Programming Support Limited

143/144 ROYAL EXCHANGE MANCHESTER
TELEPHONE NO. 001-833 934173
MIDLANDS 021-238 1794. Extension 223



CONTACT: RICHARD CHAMPION, 021-236 3781 (24-hour answering service) SPECIALIST COMPUTER RECRUITMENT LIMITED

BIRMINGHAM 021-256 5761 Freepost, Buity and Lawitouse, 35-27 Greet Charles Street Queenstery, Sirmi MANCHESTER oct-833 0427

23年。自治3月1日新聞報告與開發展

WIDINE RAST

े सार अवसी असे मार ही क्षेत्र विकास

Our client is a major organisation providing

comprehensive merins engineering and con-struction in hydro carbon development. Reteining IBM 370 under DOS /VS they seek

systems programmer with minimum 3 years ASSEMBLER experience

Veriety of projects
English-speaking anvironment
Free accommodetion end cost of Irving

ellowance (veries eccording to merital

REF. 1934

REF. 1885

Open to marriad and single persons

BOOK SPERIORS - 3 12 2 2

100 - 1 14686

· (4) (维维) 的复数形式 经基础证

An exciting apportunity for ICL COGOL programmars with proven track record to move into chellanging and rowerding rols. The company is a prestiga Gritish Ganking organisation currently retaining ICL 190D but with a 2960 schedulad for delivery mid-1979. The position will infitially be involved in the continuing development of an existing commercial project followed by all new devalopment work on 2960. Co. offers:

Subsidised mortugues.

Subsidised mortgags Non-contributory pension, liee BUPA end life assurance. Season ticket loen schemo.

Tex-ties zone

Would you like to join the Dutch sut advery of a world leader in the Min (Micro Communications. Measage Switching and Sollware field? The company lised is a British beasd inter-national group with chicos in five con-tinents. They specified in the supply of Bespoin rumbay systems based on Mini

Project and Team Leaders. Analysteand Programmers at various levale, specifically at 8 years plue b) 2-8 years of Transes up to 2 years. If the idea of working at the shorp and of sophisticated technical computer promesting





Bespohn Turnkey eyetome beaed on Mini and Micro processors spocifically in the Communications Message Switching, network, Process Control and beats software faids Any sesemblar lenguage is desirable. To meat their expension goals they are creating numerous additional speciality project sagms requiring Consultants, Project and Team Leaders, Analysistand Programmers at various levale, and the state of the service of the serv



NATIONAL //

Realistic Salary

+ Benefits

CAPP ASSOCIATES Computing Services LONDON AND MANCHESTER

061 236 9085 FAULKNER HOUSE FAULKNER STREET, MANCHESTER MI 400

EXCELLENT OPPORTUNITIES FOR CONTRACT STAFF

In line with current expansion plans we will be pleased to hear from programmers, analysts and consultants of professional disposition with a solid background in any of the following disciplines:

> FORTRAN MARKIV COBOL BASIC RPG PL/1 BAL

and any DATABASE or TP MONITORS

Forthcoming internal projects include developments on in-house equipment. Current external projects cover U.K., Europe, U.S.A. and the Middle East.

Please telephone or send career details to: MARGARET DRISCOLL TANGENT COMPUTER SERVICES BROOK HOUSE, 4 EASTERN ROAD ROMFORD, ESSEX RM1 3PJ

TEL. ROMFORD 0708-44181/2

Top contract fees

COMPUTER SERVICES

Overseas

Senior IBM Systems Programmer

A major industrial group, based overseas, needs an experienced senior-level Systems Programmer to act as Technical Support Supervisor on its sophisticated IBM installation. Your responsibilities will include:

- * Planning and conducting training programmes for systems development and operating staff.
- * Optimisation of software environment.
- * Creation and maintenance of source programme and documentation libraries.
- * Development of Installation standards.
- * Software performance measurement techniques.

You will have had at least five years' DP experience, two of which will have been spent in systems programming in an IBM DOS/VS installation. Your technical appreciation of both IBM hardware and software will be coupled with a thorough knowledge of DOS/VS, CICS/VS and POWER/VS (or GRASP) and familiarily with the design, programming and maintenance of software and software standards. You will also have been involved in training.

Salary will be up to 100% more than your current earnings. Benefits Include free furnished accommodation, and assistance with school fees, carpurchase and medical costs.

Please write with details of qualifications, experience and current salary and quoting Ref. 179 to: Mr. A. Cook, Grafton House, PO Box 214

THE REPORT FROM MORE WITH THE PARTY OF THE NORTH PARTY OF THE PARTY OF

WELL CIVE YOU MIDLANDS

which is now outting into ellect a lorwerd looking development plan incorporating a grodit-unit approach combined with n salf-learning system. The basic teaching departments are organized into three Olivisions — Engineering, Applied Science and Commerce & Design, and break, inter-disciplinary cantres and Institutes — Toxtle & Clothing and Medical & Health Care — which me relevant to the pands of Health Care. relevant to the needs of Hong Kong. The Polytachnic Invites applications for the following posts which ere tenebla from 1st Septembor, 1970:

Department of Computing

Science Principal Lecturers/Senior Lecturers/Lecturers in Computing Science

(Preference will be given to epplicants with interest in one or more of the following subject areas: Management Information Systems, Computer Graphics, Computer Education in Secondary Schools, Computer Assisted Instruction, Systems Progrem numbered Application of Computers in inventory control, production control. banking, Instruence, hospitol systems and all disciplines tought at the Polytochnic; e.p. Engineering, Mathematiks, Toxillas, Dosign and Commercial subjects.)

General Qualifications for Appointment

Principei Lecturer: (e) a depron or protessional qualifications; and (b) on odvenced specialist qualification or extensive experience in a specialised field; and (c) substential teeching end industrial/commercial experience: and (di proven administrative nbility Benfor Lecturer: (a) a degree or professional quellications; plus pralarably en advanced specialist quellication; and (b) at least five years' professional experience; end (c) substential teaching and/or industrial/commorcial experience (about three additional years); end (d) proven administrative ability.

Lecturer: (a) e degres of professional qualifications or et laest e Higher Technician quelilication in the appropriato lield of study; and |b) at laest live years profassional or industrial/commercial experience or at feest three years teaching experienca or e aultebla combinetion of professional and teaching experience.

Satery 9 cates: HK\$ 98,220 to HK\$ 121,200 p.e.

HK\$ 79,990 to HK\$ 107,340 p.a.

HK\$ 44,220 to HK\$ 79,500 p.e. by 11 increments.

Note: £1=HK\$ 9.95 on 29th October, 1978. (Commencing salary will be commensure to with qualifications and experience.)

Conditions of Service

Appointment will be on two-year gratuity-bearing contrect tarms initially. Therealter sulteble appointees may be offered further contacts or superennueble terms of service at the discretion of the Polytechnic. Benefits include long leave; free passeges subsidised accommodation; medical and dental treatment; children's education allowance; and estamined grafully equal to 25% of basic salary received over entire contact passed. over entire contract period.

Application larms and further information are obtainable from the Hong Kong Government London Office. 9 Grafton Street, London W1X 3LB, U.K. Completed application forms should be returned to the same office by 1 11.

by merit and is determined by your efforts.

quoting reference: CN 47-8MC

Interviews will be held in Birmingham.

This is a new appointment creating an unusual opportunity for

career development. Applicants inleatly should have 2/3 years

Teleprocessing experience particularly in the use of T.P.S. on 1900

hardware. The Person will be responsible for a small learn and be

Computer Services, through successful planning and implementation is

an expanding and developing company. Personal development is strongly

encouraged with full support of continuous training — promotion is sold

Find out more about this position by telephoning our Manchester Office

involved in working with and influencing user departments, N.B.C.

argontly required with the following experience IBM 370 RPG II Burroughs 6700 COBOL

CONTRACT PROGRAMMERS

IBM MTCS Top rates - weekly paid

Focus Computer Services (Emp. Agy.) 28a Devonshiro Street, London, W.1 Tel: 01-4B7 57B1

EUROPE

THE GEMINI CONTRACT STAKES TALK STRAIGHT TO THE HORSES MOUTH

or at least to the right and of the horsel

We are the U.K. Contpeny of the Cop Gontini Sognti Grunp. Europa's larges software survicus operation.

We have routine daily contact with 50 branchos operating in 14 dillatent Europenn countries.

Why complicate things by dealing with middlomen? Come end ragistar with us for first class deels in Europa and the

Phone Pat Forde on 01-828 6634 (daytime) or 01-223 6713 (evening) for further information and starting



Carger Specialists and Constant D.P. MANAGERS, SYSTEMS AND PROGRAMMERS AND PRO

SYSTEMS AND PROGRAMMING OPPORTUNITIES

★ JOB SATISFACTION ★ CAREER PROGRESSION ★ GOOD SALARY

MARK PROMISSION PROPERTY. 图. 机印度面的 Light Clark Control

WHY TRAVEL to central London? Major group of companies based close to the N Circuler seaks programmers with MINI ASSEMBLER experience to work on real-time information and control systems on PDP II aquipment which runs under RSXII opereting systems. Smell project taems encourage involvament of all stages, thus giving design experience end user contact. Company offers: Friendly atmosphera working in a small

MIMI PERSON.

1066553

新疆发展设施

Prestige company operating on a global scale

are now recruiting programmers with at least

2 years' experience on ANY MINI ASSEME LER to work in their new modern offices

Having largs DEC PDP If aquipment and

expanding et a rapid rate, they have a wide range of on-going projects both in herdwere and soltware. Co. offers:

Opportunity for oversess travel EXCELLENT TRAINING opportunity in RSXII, RTII and RSTS

Extansive treining in tip-to-data technology REF, 1940

Thinkshiller Market of the

Andrews Cold (Marie 1971)

北端歌性の編集 さんりょう

Our cliant, one of the world's Isading sup-

Our cliant, one of the world's Isading suppliers of high technology products end services to world wide energy end industriel merkets, ere seeking e treines anelyst programmer. If you have 12 months' COMMER-CIAL Cobol programming experience this leelentestic apportunity to be trained in enelysis. They have a large TP network with links to Europe and after full training in database and TP. Co afters:

Fantastic job apportunities

Excellant prospects for promotion

Excellant prospects for promotion TRAINING in ANALYSIS, TP and OATA-

- group Excellent promotion prospecte
- Discount on compeny products Sports and social club

非關 细胞的 **物. 超期的前7**次函数数 顶弧点流淌

International group of companies with outstanding reputation for efficiency growth and investment sooks programmer to work on a veriety of new projects. Ideal applicant will have at Iseet 12 months. IOM programming experience of ANY HIGH LEVEL LANGUAGE experience of ANY HIGH LEVEL LANGUAGE
Lots of super training opportunities and career
prograssion is structured and repid within this
company. Co. ofters.

RELOCATION EXPENSES it required

- Lita Assuranca, Paneion and sickness
- Super treining opportunities Excellent working conditions

公司 "你说明你,你就看你的我们的知识

350 5 交联部署 在1000年

Multi-netional conglomerats company are seaking e systems programmer to undertaks Juli systems reaponsibility of their IBM 37D herdware. Applicants will have good technical bockground with at Isest 2 years' ASSEMB-LER prelerebly with COBOL or PL/I, running under either DOS or OS. This is an excellent apportunity to join the argnnisation of senio

level Co ollers
EXCELLENT working environment, FREE Junch and BONUS

lunch and BONUS Security in a growing organisation REF 1938

Prastige organisation providing services to 9 milsh banking industry requires systems analyst to become involved in the implemen-

tetion and continuing development of large on-line communication system. Ideal can-

didets ehould heve programming back-ground, experience of working in Operating system anvironment with TP bias and able to pley a major role in the design and implementation of an on-line transaction

Mongage subsidy
Non-contributory pension schame
Personal loen achome
RELOCATION EXPENSES

PERSONAL AMALYSIS 美洲海镇66660 1 / 3/6/35

AND THE COMMENSATIONS

TERMINE CONTROL

in Confide

Dur client is part of a major international

corporation with business injarests through-out the world. Retaining IBM 370 (due to be

upgreded shortly end with plane for nev

equipment and development) seeks pro

gremmers and analysts to join their computer

services teem in modern offices on the sout

REF. 3897

Non-contributory pension scheme Mortgege subsidy Flex-hours

Sports and Social club

Exciting and CHALLENGING opportunity awaits e systems enalyst within this worldwide and prestigious company. Ideal appl cant will have a programming beckground in COBOL and/or ASSEMBLER, and at least 19 months' experience as a systems analyst. Our client is awaiting the Installation of a NEW IBM 37D in Docamber and this is a super opportunity to work in a brand new area or now projects Co. olders.

- Super working environment Excollent career opportunities
- All new dovslopment work

REF. 1939

Stimulating and satisfying programming posi-tions at varying lovals exist within major travel organisation based in Southern En-gland. On-line applications relating to stock gland. On-lins applications relating to stock control, lorward planning and acheduling on their 19 M 37D instellation end applicants should ideally heve 2-4 years' IBM COBOL exparience parheps with PL/1. Having e large TP network, a distinct asset would be a knowledge oil teleprocessing end database lachniques — although treining can be given.

Co. oifers:

Excellent working conditions in a Iriandly employer.

processing system. Experience of ICL herd-wers en advantage. Co. ollers:

Treining in TP and Detabase where Parks include trevel concessions

Superb opportunity awaits programmers with proven track record to improve his ther career prospects. Raply immediately it you have IBM 370 PL/1 experience (preferably with some detabase — but exp. not assential) for our client a major UK organisation. A wide rangs and linancial environment. Co. ollers:

Good career path within e well-structured

Excellent perke include SUBSIDISEO MORTGAGE

Junior Systems

ANALYST — LONDON

to £6,500

+ SUB MORTGAGE

Mejor British Insurance company with essets exceeding £440m seeks persona with minimum 12 months' experience of systems

snalysie and deeign covering mejor aspects of systems work, prejarably with en ICL COBOL

programming background. Company has well plenned future including delivery of ICL 2990 next year running under VME/B and covering projected development work. Co. offers:

REF. 1920

resolution with the second MOLLAND £11.000 circa

Unique apportunity exists within internatione company deeling with household end indust-nal products. Beesd in Rotterdem the orgen-iselidn reteins IBM 370 usa COBOL under DOS. CICS/VS with the use of OL/I. Pro-grammers and enalyst/progs. required to assist in the davelopment of on-line commer-cial and linencial systems. Cendidates should heve 2-3 years' COBOL experience. Co.

- RELOCATION expenses
- 9% vecation ellowence end 6% protil
- English-speaking company

REF. 1991

REF. 1902

Principanimens -- Essex £5.500 NEG.

Manegement servicee division of major British group with annual turnover of almost E1D00m seek COBOL programmer with ninimum 2 yeers' I9M or ICL CO60 L to work within a project team. Programmers will become involved in program design, coding, testing and documentation es wall es easistance in systems implementation. Co. ollers:

- Comprehensive range of epplications RELOCATION II required Opportunity to move to more advanced
 - Flexi hours end subsidised restaurar

REF. 1968

We would like to meet computer professionals on behell of our clients with around 4 years' ICL 1900/2903 experience to discuss

PROGRAMMERS

MIDDLE EAST

G. £12.000 TAX FREE

long end short term assignments in the Middle East Co. ollers: Scope in a variety of areas

Accommodation end expenses paid by

* FULL 2900 training FLEXI HOURS, FREE lunch, BONUS. Annuel REVIEW, sports end social club REF. 1849

For further details please ring or write to our London Office: 01-734 0152/3010 (24 hours)



KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON, W. 1: TELEPHONE 01-734 0152/6 (24 HOURS) OFFICES AMSTERDAM PARIS MANCHESTER BIRMINGHAM





Data Processing Recruitment Consultants

Real Time Programmers Scandinavia & Spain

Salary: £14K plus benefits.

The leading Scandinavian Systems and Turnkey Supplier with offices In Scandinavia, Nigeria and California requires FORTRAN and/or ASSEMBLER programmers for its flome besed and Spanish operations. Whilst the applications under development are sophisticated Real-Time projects previous experience of Real-Time is not absolutely essential but in-depth FORTRAN and ASSEMBLER programming expertise is a pre-requisite. Preference

recent or current experience on UNIVAC 490/4, UNIVAC 1100 series or iBM 370. Willingness to relocate to Scandinavia or Spain for

an extended period is absolutely essential and to assist you in your removal our client will meet all relocation expenses in addition to providing inItial paid accommodation. Interviews will be held at our London offices In late

November and early December.

Micro Processor Specialists **Rural Thames Valley**

Salary: £6.5K - £8.5K

A small but rapidly expanding Micro based System Informal almosphere. supplier has very recently established new Heed-

The company is now seeking several Micro or Mini Computer Specialisis with 12 months or more practical applications or software development/ design experience in either a computer manufact uring or software systems house environment. If you have relevant experience we invite you to discuss your career advancement prospects with U.K. and Western Europe. our Clients at your earliest convenience in an

Those who have Assembler or Basic language experience on Mint or Micro hardware particularly DEC PDP 11, DQ Nova/Ecilipse and T.1. 900/990 or Micro Pressure and T.1. 200/990. Micro-Processors preferably Zilog Z80, Intel 80B5/6 or Motorola M6800 will be Ideally sulted. In addition to above market starting salaries our client offers excellent career advancement

Process Control Specialists West Germany

Salaries to £15K

Much of the forefront development in Process spheres of activity. In particular, extensive Mini Control Software emanates from Western Europe and If you aim to move into frontier technology the opportunity arises to join a highly reputed Systems and Soltware Development Group engaged in exciting pioneering projects in the areas of:-Robotics , Artificial intelligence , industrial Control

Systems or Liquid Flow Monitoring Systems. Existing and new project teams-require Consultants, Systems Designers, Senior Analysis, Analysi/ Programmers and Programmers with direct and relevant experience in at least one of the above permanent housing.

Computer Assembler is essential, and a degree or equivalent would be an advantage.
You are certain to contribute valuable expertise to

this prestigious group whilst expanding your own threshold of experience through working closely with other professionals at your own level. Our client will pay full relocation expenses for you and your family and provide a generous resettlement advance in addition to meeting the costs of lemporary accommodation pending location of

(Re) 34/0

Burroughs Programmers and Analysts Netherlands+Belgium

Salaries: £12K - £15K

An Important Banking Institution based in Benelux You will be offered a permanent career position at and having one Installiation in the Netherlands and its Head-Quarters in Belgium requires PRO.
GRAMMERS and ANALYSTS to join its Development teams in early 1979.
Both installations have BURROUGHS mathrames

and consequently it is a pre-requisite to offer B3700 - B6700 experience either as a Programmer or Analyst. These positions represent an outstanding opportunity for those who have had exposure to Financial, Commercial and Banking applications.

one of the two installations and be expected to integrate into the work and social fabric of the local community. To assisi you, generous relocation and accommodation ellowances will be paid, language tuition courses are available for all employees and their families.

Whilst we will conduct initial interviews, you will spend one day at the Company's Head-Quarters — of course at its expense—for further interview and

Database Project Leader Kuwait

C. £16K (Tax Free)

The successful candidate will be required to demonstrate current programming and dealgn exposure in the implementation and support of Data Base and/or Real-Time Systems, particular involvement with IBM's own software iMS, CICS, TSO or the products of the independents, namely CINCOM's

We are requested to recruit a Project Leeder (ideally 27-35 years) offering an in-depth knowledge of both Data-Base and Teleprocessing techniques in an iBM

TOTAL/ENVIRON; ALTERGO's SHADOW/QUOTA or ADABAS. Preferably your past experience should have included PL/1 or COBOL programor ADABAS. Preferably your past experience should have included PL/1 or COBOL program ming and design and analysis experience within a

financial or commercial environment. Supplemental to a high salary you will receive additional benefits including married or single status accommodation, full relocation expenses, life and disability insurances.

Logistix, Freepost 32, London WIE 3YZ Telex 28800

Avon House, 366 Oxford Street, London WIH 9HA

INTERNATIONAL BANKING ... COBOL PROGRAMME

- a. Non-contributory Pervious Scherge
- одану тар **То 15.1100**
- Tree Title Association
- dende et Muttjaga
 stall trans at forAvadable

An outstamling and exciting opportunity for a Cobol Programmer in this shortly to be signed system 3715 installation which is price of a ghiftal OP Banking System Applicants should have a minimum of 18 months. COBOL experience, financial applicable. knowledge an adventage
The applications involved will be Batch and On-Line systems

This position offers excellent from beyonds and the opportunity to play an imperient obesit DP Department. The successful applicant will report theoryly to the D.P. Manager.

BOBBY MCCOHMICK, OIRECTOR un 01-603 7335/01-602 485 t

Hillstine Handstein Herentie Ind 58 Pembroko Road, Linckin WE. felaphone. 01-603 7335 (##25) Computer Servicus & Recruitment Consultants.



H.N.C. in Computer Studies? or Computer Experience?

This is an excellent carear opportunity for a young man or woman, preferably with H.H.C. qualifications in Computer Studies, to gain water anging programming experience with The Scientific Computing Section of The Writtening Research Laboratories, Backbardes

Main responsibility will be the development of systems to barrifle data generated by the Laborning's Toxicology Section on a POP 1 tVO3 and to provide a trial/data management system on an IBM 370

Knowledge of FORTRAN is essential and a knowlingge of thoth MACRO would be an odventage. After initial comprehensive training increased involvement in other systems

The Laboratories ore port of The Wollcome Group Research and Development and are concerned with vetorinary plantamentations and control of area t posts. They are situated on the cutskirts of Barkhamsteri

Wa offer an attentiaive salary and first-class boundes include ponemics assistance with infocation expenses, which appropriate

If you receinterested, please write or telephone for an application form, quoting releise A. J. Mnuis Site Personnel Officer

The Welicoma Engadatura Ltd. Borkhomsterl, Hurts Tol: Borkhamstud 3333 axt 3163



C, £7500

S. Beds. Systems programmer 10 £8000 TECHNICAL SUPPORT London & S.E. Good exp. of Op Systems of T.P. or Octubiso. (Poloif 10 £6000 TRAINEE ANALYSTS PROGS. or PROG./ANALS. Any COBOL or PL/1 lot 18M 370 (Bill). S. Beds. SENIOR ANALYSTS Central London. C. £6500 ANALYST/PROGS. ms. Senior Analysis will lead unclocis. [Polar]. West London **BUSINESS ANALYST West End** London & S.E. Maintame and Mint areas. Oped technical background. (Peter). ANALYST/PROGRAMMER SW1

TELEPHONE: 01-839 6087 Bill Taylor, Peter Barson, Barnard, Davies & Grand Line Computer Personniel Control of 107 Jerniya Street London W

DAVIES & WARD LTD



Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

HEAD OF PROGRAMMING SERVICES SURREY, C £6300

Our client is a well-known manufacturing and merketing organisation who are a leeder in their field. Thay have successfully operated computers for some years and have developed sophisticated applications using on-line facilities for local use. They now wish to appoint a mature person to HEAD THEIR PROGRAMMING SECTION. The vacancy will probably suit a SENIOR PROGRAMMER who has

- Around three years + solid programming experience ANY HARDWARE, ANY LANGUAGE.
- Reached the point in their career where they now feel ready to eccept responsibility and greeter challenge.
- Ambitions to remain in the main stream of programming.
- Ideally some background of real-time or on-line computing.
- A desire to express his/her own ideas and put them into prectica.
- Some supervisory experience looking efter a small teom of programmers
- Accepted the necessity of being judged on achievements and rewarded by personal performance.

This is an outstending opportunity for tha right person to up-grade his/her career in a positive fashion. Prospects open up the possibility to become DPM in time. In appropriate cases relocation expenses will be paid.

> PLEASE WRITE TO US OR TELEPHONE US NOW IN ORDER TO MAKE ARRANGEMENTS FOR IMMEDIATE INTERVIEWS TO TAKE PLACE EITHER IN LONDON OR THE SOUTH

IF MORE CONVENIENT TELEPHONE: JACK COLLINGS, OUR MANAGING CONSULTANT, BETWEEN 7 P.M. AND 8 P.M. ON (0273) 833120



Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

CENTRAL LONDON

PROJECT MANAGERS/CONSULTANTS SYSTEMS ANALYSTS/PROGRAMMERS **SALARY CIRCA £9,000 PER ANNUM** SALARY CIRCA £7,500 PER ANNUM

OUTSTANDING OPPORTUNITY FOR YOU TO ADVANCE WITHIN A VERY DYNAMIC AND PROFESSIONAL ENVIRONMENT

Our cliants are the U.K. leaders providing services in the Benking. Financial and Commercial fields. The demends being pleced upon them by their cliente have nece

Do you metch the following regulrements:

PROJECT MANAGERS. CONSULTANTS

PROGRAMMERS:

We are looking for people with above average ability to till these roles. In return we should expect you to

- t. Portray the level of experience to enable you to undertake a variety of projects related primarily to the Banking, Finance and
- Commercial fields.

 2. Heve the ebility to motivate and lead others in satisfying user needs.

 3. Possess experience gained from working with mainframe or mini hardware and software.

 4. Convince us their you can undertake levels of responsibility and identify business solutions as well as affect these.

SYSTEMS ANALYSTS

To satisfy the needs of our clients you will: .

t. Possess a sound programming background.

2. Have progressed into Systems Analysis with the ability to work well with users.

3. Went to progress your career in an environment offering you maximum apportunities.

4. Preferably be able to demonstrate leadership qualifies.

Any programmer experienced in either low or high level lariguages wishing to leke the next step forward in his her barear should talk to us and in Joing so hopefully be successful in widening their experience and gellning further progression.

PLEASE WRITE TO US OR TELEPHONE US NOW IN ORDER TO MAKE ARRANGEMENTS FOR INTERVIEWS TO TAKE PLACE AS SOON AS POSSIBLE IN LONDON OR THE SOUTH



Edmund Howard's Client Album

AVIONICS/SCIENTIFIC **PROGRAMMERS**

COBOL PROGRAMMERS

PROGRAMMERS CONSULTANTS

SENIOR PROGRAMMERS

ANALYST/PROGRAMMERS

From time to been we not asked by a topological U(K) and excesses the for short and here trees assuments. So V(K) we are between ples or at

Edmund Howard & Partners Computer Personnel Consultants

5 Brighton Road, Surlyton, Surrey Telephone 01-399 9183.
38 Grafton Street, Dublin, Telephone 775.756.

Programmers and Programmer/Analysts

JOIN THE CHAMPS

AND, DR. WHO SWITCHED THE FIRST ONE ON AT THE LONDON PENTA HOTEL JUST LAST JUNE AND THE SUCCESS HAS BEEN ACCLAIMED WORLD-

The success story continues . . . Orders for the CHAMPS system have just been placed by two of the largest hotel firms in the UK and Europe and enquiries are flooding

Here's your chance to do something excitingly different with your career and at the same time join in our

- New on-line language MIIS
 Computer Assisted teaching
- Medium and large-scale minis - Interesting Applications

Marcol's Hotel Systems Division, a small but very competent group of business systems specialists, require additional programming staff to expand their services to both U.K. and European hotels. Applicants must be able to work to a high standard whilst closely involved with the users and he willing to work to a high standard whilst closely involved. with the users and be willing to work at a variety of locations when required.

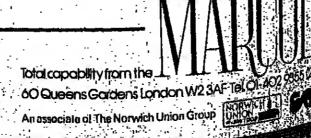
If you have at least three years' experience programming in any high level language and entitle working and learning with the really top level specialists in your field please do apply not

Those applicants who have also in their background experience of any of the following are especially welcome to apply:

- On-line or real-time commercial systems
- Mini or mainframe business terminal systems
- Hotel, booking, or reservations systems
- MUMPS programming systems
 Technical French or German

FOR FULL DETAILS OF THESE AND MANY MORE PROGRAMMING OPPORTUNITIES RING OR WRITE: DEREK ASHLEY OR PENNY BAILEY

* Computerised Hotel Accounting and Management Processing System



RECRUITMENT AND CONSULTANCY SERVICES LIMITED

Greenock House 19 Cuckfield Road Hurstpierpoint Sussex

Telephone 0273 833848

SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

DO YOU CONSIDER YOURSELF TO BE AN ABOVE AVERAGE SALESMAN?

LONDON BASED

If you do, then we wish to talk to you about an exciting opportunity with a compeny who are new in the U.K., but world-wide, have an excellent sales racord in Real Time Mini Computer Systems.

THERE ARE NO LIMITS TO EARNINGS AND A GOOD BASE SALARY WILL BE OFFERED PLUS A GUARANTEE in the cese of a successful Salesman plus a car. Our clients are looking for reel opportunists who reelly mean to sell and go pleces. We would like you to telephone us the moment you see this advertisement so that we can discuss with you how this opportunity can provide you with a rewarding and satisfying career.

SURREY

(NEAR GUILDFORD)

PROGRAMMER COBOL

Seiary circe £6000

Our clients are going through en exciting phase of development and wish to recruit a young and energetic programmer who will join their existing team and be capable of developing into their sophisticated systems epplications. A programmer of two years' standing with some knowledge of systems would be preferable. If that person had been involved in the development of minis, this would be very desirable. The main emphasis is on the person as both the personality and attitude towards solving business problems is vitally important. The opportunity is a challenging and rewarding one and you will be working in modern end comfortable conditions. We would like to discuss your cereer with you immediately so that we can tell you how this opportunity can fit into your cereer plans.

LONDON (WEST)

ARE YOU THE PERSON TO FILL THIS SOFTWARE ROLE?

SOFTWARE SYSTEMS MANAGER

Salary circa £9000 according to experience

We are acting for clients who are daveloping sophisticated environmental test equipment. The person they are seeking will be in charge of the computer control of a wide range of special test systems.

The requirements are as follows:

- 1. Exparience in the software development of PDP or GEC 4000 or real time microprocessor
- The ability to negotiate with outside software organisations and co-ordinate their activities.
- The ability to motivate and communicate at all levels.

The appointment is a progressive and challenging one and the cendidate salected will be joining one of the foremost companies in this field.

OUR TELEPHONE NUMBER IS HURSTPIERPOINT (0273) 833848 AND WE HAVE A 24-HOUR ANSWERING SERVICE



de Computer Recruitment

A division of ATA Selection and Management Services, recrultment consultants to industry and Commerce since 1952

LANCASHIRE/ **YORKSHIRE**

SENIOR COBOL PROGRAMMERS

North Menchester £5,800 p.a.

A lerge retailing organisation is upgrading its inetalletion to e 2980 end requires good COBOL Progremmers to lead teams in a complate lawrite of ell systems using FILE-TAB, PLAN and verious sollware peckages. This is e 3-4 year project where opportunities for edvancement ere significant. The working environment is excellent and a stell discount is otterad on ell merchanisa.

JUNIOR SYSTEMS PROGRAMMER

around £4,000 p.a.

A feading angineering compsny need e bright young greduate to join s team end to be aducated into a tull Systems Programmer. The successful candidate will have software expenence praferably with some understanding of assambler. This is a superb opportunity to increase knowledge within an expending anvironment.

ANALYST PROGRAMMERS

to £6,000 p.s.

Oue to e depenmental restructure this large aubsidiary compeny manufecturing toiletries is looking for two Analyst Programmers to develop and maintain systems on an IBM 370 mainframe, POP 11/70 and 11/34 minis using CORAL. The main projects include automated warahouse system and process control using Totel Oetabase. Cendidatas should have 18 months commarcial progremming experience in any languega. The offices are in e rurel erea, served by e good public transport eystem and fringe banefits such es subsidisad mee's and etaff discount on ell company products epply.

For further datalla of the above positions or an informal discussion as to how you can advance your career telephone OB1-832 5656.

ATA COMPUTER RECRUITMENT ANGLIA HOUSE, 66 CROSS STREET, MANCHESTER M2 4LA

LONGON (01) 637 0781

B6 Cross Si. M2 4LA

MANCHESTER (061) 832 5856 BIRMINGHAM (021) 643 1994 Woolworth Building, 102 New Si.

BRISTOL (0272) 211035 Equily and Law Building 36/38 Beldwin St. 851 1NR

EDINBURGH (031) 226 5381 CRAWLEY (0293) 514071 Anglia House, 24/26 Frederick Si. 36 The Broadway

WEST **EDINBURGH** COUNTRY TRAINEE SYSTEMS **ANALYST**

Our clients are recognised world wide for their high technology products end are beed in the West Country. They are shortly taking delivery of an IRM 3032 to entrance their present IBM 370/158 installation. They therefore need edditional programmers and systems snelysts at all levels of experience in COSOL. JCL.

The company's officee are situated in a rural part of the West Country, 25 miles from the coest and close to several areas of outstanding natural beauty.

The selecies for these excaptional opportunities ere In a selected for these exceptioner approunted size datelled below end in addition e PROOUCTIVITY BONUS of up to 10% is payeble.

PROGRAMMERS £4,500+P.B. = c£4,900

5ENIOR PROGRAMMERS £5,262+P.B. = c£5,738

PROJECT 5ENIOR PROGRAMMERS £5,857 + P.B. =

CE0394 LEAO PROGRAMMERS £6,467 + P.B. = c£7.052 SYSTEMS ANALYSTS £5,282 + P.B. = c£S,73B SENIOR SYSTEMS ANALYSTS £5,857 + P.B. =

PROJECT SENIOR SYSTEMS ANALYST £6,487 + P.B. PROJECT CO-ORDINATORS £7,253 + P.B. =

Ra-location essistence available and is variable acco

ding to the position for turther datels ring: 0272 211035 or write enclosing a detailed c.v. to ATA Computer Racruitment, Equity & Law Suilding, 38/38 Baldwin Street, Bristol, BS1 1NR.

eirca £4,000

Our chents, a neujor Scritish rotal organisation, wish to rocruit a trainou systems analyst his their computer instaltation in Central Edinburgh

This is a raro opportunity to gone valuable experience of with variety of commercial applications

The ideal emplicant should be affed 22/26, hevs at degrae or ognivolent quolification and at least 12 months' commercial experience as a programmer or

The selery is negotieble, oround £4,000 and the irings benefits include generous staff discounts subsidised canteen lacilities and ettractive pension schame. For further information Tel: 031 3255381 or write in

confidence, to H. W. Clerk, Esq. ATA Computer Recruitment, Anglia House, 26 Frederick Street, Edin-

MARTINS COMPUTER SERVICES The D.P. Recruitment Specialists for the Midlands/West Country areas

MIDLANDS/WEST COUNTRY

MANAGEMENT PROJECT LEADERS SYSTEMS ANALYSTS

SYSTEMS MANAGER, at least 5 years experience in D.P. with I&M Systems 3 Maldware using RPG It. Area Stoke-on-Trent Salery to £6K. Ref. M2B PROJECT LEADER, at least 5 years in IOM Systems specialising in Financial applications Area Birmingham Salery to £7K. Ref. SATBS SYSTEMS ANALYSTS. 2 years plus aquainonco using On-line and Baich Systems Liang CICS/VS and IMS Area Birmingham. Selery cE6.6K Ref SADE

SAOP SUPPORT ANALYST/PRODRAMMER required by oslephshad Soltware bouse specialising in Mini Computers. 2 years "Basic + a ramifer feriguoge. Reel bere applications. Area Nottinghamshina Salary to £6K. Ret SA38.
6YSTEMB ANALYST required by International company in the electronics endusiny 18 months plus experience an N ain Irama or Mini using Real time applications. Area Swindon, Solery c£5 6K. Ret SA6B.

applications Alea Swindon, Solaly CES SK Hat SAEB BYSTEMB ANALYST required by Enginearing Group, 18 months' plus Systems experience, prolarably with IBM Hindweis. Area Rugby, Solary cE6K.

RM SASD. SYSTEMS ANALYST, at least 18 months in Systems or O & M Aloe Quanterm. Selecy cE4 7K Rel SAS9

SYSTEMB ANALYST, at least 2 years' systems experience tegether with Cebel or a Mini language. Modern offices Canteen Float time, etc. Area Buminghem. Selery cc5.5K. Rel SA128
SYSTEMB ANALYST. 2 years' plus experience with a Cobol programming bedground Area Northeniptonshire Selery to L6.5K. Ref SA188.
EYSTEMS ANALYST has at least 2 years' system experience including use of ON-tiNt fectives area Helesowon Selery to NEG Ref SA195
EYSTEMS ANALYST at least 3 years in OP with lormal CD 80L background Area Sath Selery to CS.St. Ref SA185.
PROJECT LEADER to head now teems specialising in real time production central systems, experience with atmis Area Birminghem, Selery to C6.6F. Ref SA194
PROJECT LEADER at least 8 years in implementing systems software or packages with IBM Hordware new project work. Area Rugby Selery to C6.250 Ref P156.
ENIDR ANALYST/PROORAM MER streetly responsible to DPM at least 5.

*B.200 Mer PIDS.
EENIDR ANALYBT/PROORAM MER ibrectly responsible to DPM at least 5 years in DP with sound working knowledge of RPG 11 Area Near Summinghori Salary to S6K Ref P377 SENIDR SYBTEMS A OVIBER for main frame manufacturer. At loast 4 year commercial systems including knowledge of CDBOL or RPG 11. Area Laicoster or Bristol. Salary. CSBY, plus car allowance and generous expenses. Ref.

PROJECT LEADER at least 5 years in DP including design of commercial ON-LINE systems for minis using BASIC + Area Study Shary c16 000 Ref

PASSIEME ANALYST at thest 18 minutes opinition of influenced applications.

Also Birmington: Salary 654 5N plus low interest mortgage. Ref. SA172

EYSTEMS ANALYST around 3 years: DP P. expurience with LC L. hardware.

Area Covenity Salary. NEG. Ref. SA149

SYSTEMS ANALYST RI less 4 years experion of in ICL 1900 and minis, Area Sonerset Solary to 55K Rol SA146
SYSTEMS ANALYST, 2 years 'plus experience any hardwore Area Lecester Solary in 55,500 Rol SA141
ANALYST/PROORAMMER at least 18 months' experience on FCL 1900 under Google 11 developing real time applications Area Loicester Selary c 55,000 Rol SA132

TECHNICAL SUPPORT ANALYST/PRODRAMMER of loast 2 years using high level of batic language Alpa Bilhungham Salary C* 5.000 plus compleny call and expenses. Ref. SA137.

SENIOR PROGRAMMER/ ANALYST PROGRAMMERS

PROORAMMER/ANALYST, 2 years plus Cabol with Production control or IMS experience. Also Stalls Selery cE4½K, Ret P126
PROGRAMMER/ANALYST, at least 2 years' plus RPG II. Also Wolceston Caboling Ceff Red P242

silino, Salaty to E6K Rel P34.2

SUPPORT PROOR AMMER required by Maintiama manufacturor, et lass 18 months in RPG II or Assemblini language. Area. Nottinghamafrire. Salaty to ES 5K plus expenses. Rel P32.1

PROORAMMERS required by West Midlands Soltware. House, AI loset 2 years' experience in RPG II, Cobel or Mini language. Salaty renge. C4K-C7K plus.

axpensos Rol P387
SENIOR COSOL PROORAMMER, at least 3 years paparience using flool time applications. Knowledge of Didor stock system an adventoge. Also Laicestorshire. Salary to £6.5K. Ref. P362
PROGRAMMERS, at least 18 months. Cobol any Hardwein. Also Coventry Salary, c4.5K. Ref. P258
SENIOR PROGRAMMER, at least 4 years programming in TOS and Assambles. Mainly financial projects. Aren. Gloucostershire. Salary, to £5K. Ref. P36R.

PNOORAMMER8 with PL/ 1 or Assembler experience Area Buildin-on-Traut

SENTOR PROGRAMMER at least 2 years. COROL protectably expensioned on financial todays, provide or production central. Area. Longitudorough. Salary e156. Rol. P245. CS.28. Rol. P.245
TECHNICAL PROGRAMMER/ANALYST at least 12 months, programming in Forting of similar language. Area, Britingham of Ringby, Salary to 3.4, 58. Rol. P.287

Ref. P.247 PROORAMMER/ANALYST at least 18 uponths, working with noise Area Swindon Salary to 0.1 51° Ref. P.3.79

OPERATORS

OPERATOR, at Irest 1 year opining ICL 2003 or 1900 under Gourge III. Area Northimptonshine Salary to 14.250 Rel. OP122
TECHNICAL SUPPORT ASSISTANT. Severel years experience in 18M 370 operations with sound knowledge JCL and also a knowledge of systems programming Area Stolts Salary 14 SK-18h according to experience. Rel. 0139

OATA 19D OPERATOR. Continual shift system, at loast 1 year a terminal againment. Optioriumities for transfer to pringramming Area. Nothingham salary 23 5th plus 5A Ref. 0140.

SENIOR COMPUTER OPERATOR. Onlible day shift. 1 year's plus exprinence on IBM 370 using OOS. VS. Area Oriumigham Salary to 43.5th fled O129.

COMPUTER OPERATOR. One you plus argetioned operating ICL 1900 of Univer. Area Covanity Salary to 53.7K. Ref. 0131.

OPERATORS TEAM LEADER. At least 3 years. ICL 1800 experience with sound knowledge of George III. Area. Wikts. Salary 64.5K. Ref. 0136.

OPERATOR, At least 2 years. Operating IBM 370 under OS/MVT. A chance to operate both IBM and Amdahl hardware. Area. Covanity. Salary. package to 54,350 plus pant over time. Ref. 0P115.

We have many more D.P. positions on our register in all areas of the Midlands/Wast Country.

Contact: Graham Aston, M.E.C.I.

MARTINS COMPUTER SERVICES, First Floor, Weetern House, Deposite Albeity Hotel, Smallbrook Oudensway, Stimbingham OS 4HO telaphone 021-643 2111 24-hour ensworing service. Evenings and wook and

We are now able to interview until 6.30 p.m. and Seturday morning by



IBM SYSTEM 34-RPG 11 PROGRAMMER

We are a major Company in the Phermeceuti-cal industry with a modern factory at Morpeth in Northumberiend where we produce and distribute a range of mainly ethical pharma-ceuticals for both home and export markets.

We have recently increased our on-site data processing capabilities by the installation of a large t8M SYSTEM 34 configuration which has created a vacancy for an RPG II Programmer. The plenned development in-cludes inventory Control, Production Control, Material Requirements Planning, Production Accounting, Purchase Order Management: and Seles Order Processing and Involcing. Most of these require the use of real-time transaction processing lechniques.

Candideles should ideally have at least a year's experience in RPG II on a machine within the System 3 family, but consideration will be given to those with a relevant background on other herdwere or in other languages. They must eleo be willing to epi en ée rly involvement in Systeme

Selery will be negotiable according to experience and qualifications. Other employment conditions include 4 weeks amuel holiday entitlement, Sickness Benefit, Contributory Pension Scheme and subsidised Staff

The factory is situated in pleasantly rurel aurroundings within easy reach of the uncrowded countrysido and beaches of Northumberland. Assistance with rere-location expenses will be provided !!

Picese eppty Io: C.M. Whitney, Personnel Monager, Seerle Laboretories, Whalton Road, Morpeth, Northumberlend. Telephone: Morpeth 4311.

SEARLE

What you can get up to with Real Time Mini in Croydon

To £8,000 for Programmers with Intel 8085 experience

First thing you do after landing your plum job is beit off to Germany or Switzerland for a few months (so start rehearsing your yodel) to bone up on some of the world's leading communications systems secrets.

Meantime, if it's meant moving to somewhere nice near Croydon. your new house purchase can be "going through" ready for moving in when you get back — with the help of generous relocation expenses chipped in by our clients.

(Resi Time Mini, see, thinks of everything.)

To £8,000 for Analyst/Programmers (Croydon)

Naturally, it will be nice if you have communications experience yourself. Certainly, a scientific, meaaage switching, process control or flight almulation, type background is a big help.

A degree is essential, though we'll bend the rules if you have very

Languages: mini or micro Assembler (Real Time). Applications: Disl 01-836 9719 or 9882. Ask for Beryl McLaren.

> Computer Appointments (Real Time Minis Place) Suite 43, 12-13 Henrietta Street,

catascent

CONTRACTS FREELANCE

PROGRAMMERS register now for immediate and forthcoming requirements

throughout LONDON U.K. EUROPE

If you have 3 years in D.P. If you want a top contract wou want a top rate:

CALL

BOB EDWARDS

Datascene RecruitmentLinil 01-439 1856 24 hour answer phane

SERVICE ENGINEER

Ouo to continued expension we now urtent our Sirmingham / Brietol / Lordon (strype) in mond workshop: To work on the successful terminal ranga.

Salaries to: C4500 are being offered a positions cerry a company care.

Telaphone now or write to: Bryan Hazeltine Late. Terminal House Ribmond, Line To 01:048

Analysts-Come Aboard Now! Selfaway to the West Country and experience a new way of life, deep in the Colswolds near Beth, Bristol and Gloucester. Oesign and implement new on-line systems including stock control, order entry, production coating and bought ledger. Utilise a forty reminal new-ork on-line to a 1 magabyte fCL 2950. Enjoy beautiful ectivities. Apply your analysis skills to numerous epplication areas from a central site-one of five-in the heart of rurel England. Our client at a large, quality engineering company with a number of UK thesi and extensive overseas operations. Financial Relocation to £1,500 Gross Salary to £6,500 £8,000! Speaked an application area for e law on-line system. Contact us tor addronal details, interview dates and a lad sheet - by phone or writing direct - and discuss with us what this apponentials will mean for your and your landy Do it now - before your Phine 01-388 4523 or 01-388 4865 and ask for Immy de Bege or Richard

A DOWN

JdB

Associates

Warren Street, London W1P5DL Agency Ucence SE(A) 3232

Senior Computer **Operators** (3031/158)£4,500 plus

We are seeking Senior Operators for our large computer centre in the City which comprises a dual configuration 158 and a 3031, together with PDP machine. A three shift system is operated covering a five day week.

You must have O levels and at least two years' experience on large IBM 370 machines, which includes a full working knowledge of the VSI operating system and JCL. If you, are familiar with VM/CM5 and dual configuration operating techniques, so ntuch the better.

We offer an ettractive salery, four weeks' holiday, n-contributory pension and life assurance schemes

Please contact Sarbra Coulston on 01-588 2355 Ext. 683 to arrange on Interview or write to her at the Personnel Department, The Stock Exchange, London EC2N 1HP.



The Stock Exchange

B.C.L. MOLECULAR 18 Mk. 2

Engineers merchants, situated in East Kent require software house contract halp for detailed dealgn, and implementation of on-line stock control system, to interface with existing programmes.

Details of eatistist clients on similar applications vital Proposals in writing to Box No. 1999

Senior Customer Engineers

Versatec, part of the Xerox Group, supplies highly automated data processing aquipment to Industry for computer applications.

Continued success requires further expansion of our Engineering Department; we are, therefore, looking for senior engineers -- preferably with DEC PDP.11 experience — to complament our existing team. The job, which involves both Installation and

maintenance of modern electrostatic graphic subsystems in the South West, South East and Scotlend, is both challenging and rewarding Applicants, male or female, should be self-motivated and capable of working from home or a local office with the minimum of supervision. Salary and benefits are

above syerage; an incentive schame and BUPA membership are included. Contact David Goddard for more details.



Versatec, 27/35 London Road, Newbury, Berkshire. Telephone: (0635) 42-121.

REAL TIME ★ Systems Designers * Programmers *

PERMANENT of CONTRACT to work with our project teams developing INDUSTRIAL and COMMERCIAL opplications in COSOL, CORAL, RPG, PLAN, for clients in London Contact I. Gold, on 01-388 0036. 38 Warren Street, London W1P 5P0

computer consultants

IRISH SUGAR COMPANY LTD.

PROGRAMMER ANALYST/PROGRAMMER

The frish Sugar Company currently operates an ICL 1903A Computer at its Head Office in Dublin, with a communications-based network of Oatapoint 1132 Terminels at each of its Branches, Further expansions are planned in the elec of Distributed Processing using Minicomputer and Micropiocessor Technology.

Positions Require

- Background of Good Programming Ofsciplinea. Minimum 3 years Cobal Programming or
- Knowledge of RPG ti will be considered an advantage as will experience of communicationsbased systems and programming.

In addition the Analyst Programmer position requires

- Active involvement in the design, documentation, testing and implementation of at least one major
- Knowle dge of basic Systems Analysis and Ossign
- Proven cepability to communicate effectively with

Successful certdidates will share in the development of an integrated communications-based Menagement Information and Control System, They will elso have an opportunity to participate in the development and use of microproceasor technology in a wide variety of

applications.

These positions offer excellent cereer prospects. Selsry is negotieble end will reflect the high standards required for both positions. Other Baneliis include a Non-Contributory

Applications in writing should be sent to the undersigned.

General Manager Parsonna Irish Suger Co., Ltd., St. Stephene Green House,

OPERATORS & **PROGRAMMERS**

IBM370/135 OPERATOR

An International banking arganization urganity reads of DOS/VS POWER/VS Person include cheep mortgage.

One of Europe's teading companies seed to identify a talented OP professional A background in COBOL and RPG II' useful, as is a knowledge of herdward according Fernancial potential to debt considers.

ICL PROGRAMMERS

£4400

DOS-GRASP OPERATORS £4350

ASSEMBLER PROGRAMMER £7000

COBOL PROGRAMMERS

£4500-6500

GEORGE II OPERATORS
Operators with 1-2 years expenses
Central London 2 shiftin. Good prospects.

STAFFSCENE

COMPUTER RECRUITMENT 01-353 6931 9 ST. BRIDE ST., LONDON EC4

FREELANCE ANALYST PROGRAMMER

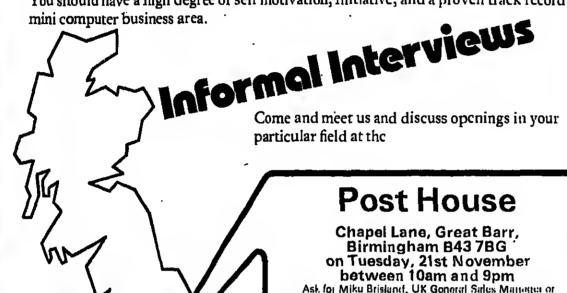
2903/4

Required for initially 3 months, probably extanding to 12 months: Min. 4 yrs. COBOL, MTS/ETS essential Location Central London! Dacamber

Send CV now to Heather Bowker, 35 Marylebone High Street, W.1. Telephone: 01-580

Sales and Field Service PDP11 Based Systems

To ensure continued expansion within the mini/micro computer markets, Plessey Peripheral Systems has a number of challenging opportunities for dynamic sales and service engineers to market or service a wide range of 'Add-on' equipment, micro computer packages and large PDP 11 based systems. Two of the appointments are at senior level. You should have a high degree of self motivation, initiative, and a proven track record in the



Skyline Hotel

Mike King, UK Customer Service Manager

(Nr Heathrow Airport) Bath Road, Harlington, Hayes, Middlesex on Wednesday, 22nd November between 10am and 9pm Ask In: Miku Brisland, UK Gonoral Soles Manager or Mike King, UK Customer Service Manager

Highly competitive salaries are being offered together with a company car and participation in our incentive scheme. Normal large company benefits apply including membership of BUPA, contributory pension scheme and relocation expenses where

If you can't meet the managers at one of the hotels, contact them on Northampton (0604) 62175 or at home in the evening: - Mike Brisland on Brackley (0280) 702105 or Mike King on Lillingstone Dayrell (02806) 663.

Alternatively, please write, giving brief career details to John Lemar, Personnel Manager, Plessey Peripheral Systems, Water Lane, Towcester, Northants NN12 77N.



THE UNIVERSITY OF SHEFFIELD

SEPARTMENT OF APPLIED MATHEMATICS AND COMPUTING SCIENCE

pplications are invited from a nd women for a post of

PROGRAMMER

In the above Department: teneble from n date to be arranged. Splary in the range £3384-£4133 on the Orade 1S salery ecole for Other Related Stalt, which rises to £4882.

Further particulars from the Registrar and Secretary, the University Shelfield \$10.21% to whom applications to copies, including the nerticepind addresses of two referes should be sen by 27 November 1975, Quois 71, R224/88.

INFORMATICS GROWING

informatics inc

Loudon WC2B 6AL 01-405-8546

Directorete of Finance Computer and Audit Division:

Computer Auditor

OPPORTUNITY FOR EXPERIENCED COMPUTER DESIGN ENGINEERS

ill region will be treated in the strictor i confidence in the lust metence with an brief details

The Managing Director CREEKMAIN LTO. 7 Rose Lane, Ripley, Surray

PERSONNEL APPOINTMENTS PROGRAMMER/ANALYST

TROUBLE BHOOTING ASSIGNMENTS CIRCA LEGED

00 021-643-0951

Computer Services

London Based £12,000 minimum

The company has essigned CAPP ASSOCIATES to recruit for the posts and a Director is evaluable to discuss the opportunity with Seles Executive who have achieved considerable auccess in a

SALES

EXECUTIVES

New Scandinavian Investment In UK Timesharing Drive

A leading Scandinevian DP services company is about to establish e substantial UK operation by the acquisition of a successful burseu, providing timesharing end remots betch services. Initial markat penetretion will be concantrated on the South East, creeting axceptional opportunities for Seles Executives; e London basad team of two is about to be eatablished to substantially incraess sales of timesharing servicee, besed upon IBM hardwere

The parent company is successful in Northern Europe and is pert of a major group with operations in steintees steet, oil, industrial equipment, building, shipping end international trading. The DP expansion is part of a plan to establish an international network in Europe and the USA.

field releted to date processing; prelerebly bureau or support services. A reelistic remuneration will be negotiated, with a significant guerantee end the benstits normetly essociated with positions et fhis level. There is realistic potential tor personal development into mora responsible roles in the aales/marketing tunctione. Please telephone immediately to discuss more fully end errange a convenient meeting if required. Quote ref: CW 46-8B.

> 01-686 9693 (24 HOUR ANSAPHONE) 19, PARK STREET, CROYDON, CR9 ITN

CAPP ASSOCIATES SO Computing Services Association

Unrivalled career development opportunities. Opportunity to travel-Europe, USA. Highly competitive salaries. Bonus scheme.

Programmers/ Systems Programmers

Central London £4.5k-£9k

Altergo Soltware Limited is the leading supptier of European systems software products throughout the world. Our product line includes the SHADDW II teleprocessing monitor and QUOTA it, the on-line program development system for tBM 360/370 installations. Altergo's product sales are increasing at over 100% worldwide each year. A number of opportunities therefore a part of the therefore exist for programmars and systems programmers to join our London based Support, Development and Applications leams.

Systems Programmers-£6·5-£9k

A good working knowledge of DOS or OS end Assembler is required. TP experience and knowledge of COBOL or PL/1 will be an advantage. Successive applicants will have the choice of working either in sollwere development or on customer support or both.

Senior Applications Programmers-£5.5k-£8k Application Programmers-£4-5k-£7k

A strong Assembler background is necessary in these positions. COBOL and TP application programming experience will be a delicite advantage. Re-iraining in SHADOW if programming techniques will be provided.
Successful sppticents will work with SHADOW II users in the development ams or in conversion projects from CICS to SHADOW sy and stee in-house applications development projects.

All employees have the opportunity of iravelting to Europe and the United States. Salaries are strictly raiated to obtilty and performance. All empto yees shere in the company's generous bonus schem

Altergo provides a very satisfying end stimutating working environment ior peopla who wish to work exclusively in the development savironment and those who prefer the day to dev interface with users, both in the U.K.

To discuss how we can hatp you to make the most of your career, please Ictephoce Pal Baker to errange an interview or write io: Pal Bakar. Allergo Soilware Limited, Imperial House, Kingsway, London WC2B 6UN.



Systems Programmer

3031 et the Fifton site, we have e vecency for en experienced Systems Programmer to essist in the conversion from SVS to MVS in the coming

We would like to hear from you if you have at least 2 years' SVS or MVS experience in some or all of

Systems Generation System Maintenance (SMP) HASP/JES2 TSD

Assembler TCAM/VTAM

Programme Product Implementation

We provide an extensive TSO network, contrad in Bristol, for the whole of the Weyhidge/Bristol Division in addition to links with the Weybuildus

Conditions of employment Include a list-class contributory pension schame, Irea sick pay and life assurance, and excellent wallare, social and aports

Plaase talephone or write for an application

Employment Maneger (Ref : AIR/37) British Aerospace Altoraft Group, Filton House, Bristol BS99 7AR



ASSISTANT AUDIT MANAGER

Cheshire

up to £8157

The Data Processing Section of our Audit De-partment require an Assistant Audit Maneger to-be based at our Headquariers in Altrincham,

Our installation currently comprtaes two ICL 4/70s which are scheduled for replacement by ICL 2972 and this conversion is being monitored by DP Audit.

Reporting to the Regionel Audit Manager, the successful applicant witl apprylee a small team during competion of a Computer Audit Plens and the position demands a high level of technical expertise relating to Programs, Operations and Data Control. The ability to communicate affectively at all levels of management both varbally and in writing is essential:

Satary within the range £6882-£8157.

Please telaphons for an application form and return it quoting reference B218/A/CW, not later than 24th November, 1978, to: Director of Personnel, North Wast Gas, Welman House, Golf Road Altrincham Cheshire WA 15 8AE Telspitone: 061-928 6311 ext 493

NORTH WEST GAS

ANALYST/ **PROGRAMMERS** c£5500 **PROGRAMMERS** c£4500

Scholl (U.K.) Ltd. are currently developing dvanced on line systems for their Production and Shoa Merketing divisions. A naw UNIVAC 90/40 utilising TOTAL Databese and on line program development is to be shortly installed.

Additional staff are now required to develop these systems through to implementation. Appli cants must have a minimum of two years COBOL. and experience of data base and/or real time program development would be of distinct advan-

Genuine opportunities for advancement into Systems Analysis will exist for successful candidates who can prove their worth to the installa-

For an early interview ring

ALAN ELLUM on 01-253 2030 or write to him at

SCHOLL (U.K.) LTD. 182/204 ST. JOHN STREET : LONDON EC1P-1DH

16 YEARS ON...

informatics inc



Computer Data **Processing** Limited

Experienced Computer Operators and Control Clerks

Due to further expension — which includes the installa-tion of an ICL 2960 early next year — we require experienced operators and control clarks to join our efficient and herd-working Operations Team.

The present configuration consists of two large ICL System 4/72's, 28 EOS80's, 14 MTU's 4 LP's, 2CR, 30 tocal VOUs and 4 RJE's.

Ideelly, applicants should have two years' operating or control experience on System 4 or ISM 360/370

Experience on 2900 - either operating or SCL would elso be en adventage. Three-shift working (Monday-Filday) is in operation.

Our office is located very close to the main-line station [London 43 minutes and Brighton 15 minutes).

Applications to: Alan Merrica Operations Menage COMPUTER DATA PROCESSING LTD. Perrymount Road Haywarda Heath, Sussex or telephone Haywards Heath 59188



digico SOFTWARE **PROGRAMMERS** £4000-£5000 Herts

We ere the leading end feetest rowing minicomputer manufacturer in the U.K., end we ere looking for young paople to anhance our range I system software. Specifically, this s an opportunity to take part in the devolopment of operating systems, compilers, loaders and the whole renge of program production tools.

To succeed in these jobs you must elready heve experience of writing in Assembler on some minicomputers, and you will probebly heve e degrae or adulvalant qualification. You may not have direct experience of writing systams software, though it halps il you do, but most importent is the determination to axpand your axperiance and succeed in lenging technical aree.

Telephona Mexine Anthony D43B-

DIGICO LTD.

Stevenage, Herta SG1 4PY Tel: (0438) 4381

CONTRACT PROGRAMMERS

urgently required with the following experience:

IBM 370 RPG II Burroughs 6700 COBOL IBM MTCS

Top rates --- weekly paid

Focus Computer Services (Emp. Agy.) 28s Devopshire Street, London, W.1, Tel: 01-487 5781

16 Bedford Row London WC1R 4EB 01~242 9356 Telex 21120



Specialists since 1971 in UK and international computer appointments

occ computer personnel limited.

Hampshire

Senior Programmers

to £7,000

Naw data centra. Mainframsa and minia

These vacencies offer you the chence to extend your skills and experience, since the data centre is comprehensively equipped with a number of meinfremee supporting on-line systems, end mini computers which ere either free standing or linked to the

Senior programmars ere encoureged to broaden their renga of experience either by becoming more involved with users of the systems or in more senior technical positions. With three operating systems end three langueges in uea, together with interactive program devalopment facilities, end etate-of-the-art applications, the scope for cereer development is unequalled. You naed to be e very competent progremmer with experience of COBOL, BASIC or DIBOL end an eggerness to learn new techniques Ref: 258 / CW / Neville John.

London to £6,000

Fortran Programmers

Our Client is a emell expending softwere house epecialising in the development of a managament control peckege that is being deeigned to run on various types of hardware. At the moment the work is based in London, but when the package is ready for merketing there will be a chance for overease treval. Other areas of epecialisation include transportetion plenning and engineering analysis especially in the civil and atructural fields. They requise:

- 1 Programmer to £5,000
- 1 Analyst/Programmar to £6,000
- Programmar to £6,000.

One of the organimer positions requires two years' transportstion experience. All positions require two or more years' asperience of FORTRAN. Further details cen be obtained from Sarah Hurn. Ref: 494/SH.

Cambridgeshire

£3,400-£9,500

Ref: 158/CW/Fran Setter

A speciallet department dealing with the application of computers to deeign and manufactura is expending and needs personnal at all lavels. Programmers with FORTRAN experience and a degree in anginaaring, meths, computer science or chamical anginaering ere welcome. There is elso a vacency for a meths or computer science graduate with databasa dasign experience to sell the exieting database softwere and act as a consultant systems deelgnar. A) a mora sanior laval Project Managers and Consultanta era neaded with specific exparience of the following

industriae; chemical, manufecturing, process and consumer. This ie an opportunity to utilise your creative talent and specialist knowledge working with multi-disciplinary teams to devalop City

Analyst/Programmers

to c £7,500

Our client, a subsidiary of a mojor morchant bank, wishes to recruit analyst/programmers will a gond knowledge of COBOL or enother high level lengunge. In be responsible for their own part of a project from stert to finish, including user-lisison at the stegos. They have a lorge mainfrome and a varied communica-

In addition to good storting enlaries, the company olisis, silers qualifying perind, generous martgage subsidy, non-contributor ponsion and Iroo BUPA. Froo Life Assurance of lour times the annual salary and L.V.'s are avoilable on joining. Ref: 750/CW/Joan Alneworth

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9366 or write to the above If it would be more convenient to telephone in the evening, or et weekends, the

Fran Satter — 01-874 6372. Serah Hum 01-673 0205. Neville John — 66 52880



Contract Programmers / **Analysts**

If you are thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.

For further details contact: Bridget Kotchie

RENDECK LTD. 100 New Bond St. London W1. Tel: 01-629 5438



INTERNATIONAL **VACANCIES**

COMPUTER ENGINEERS

Disfributors' organisations, mainly in the Middle East Their plants or antirely independent from us but they have asked us to held their recipilment. ncreased demend for our products oversees has led recruitment of experienced Computer Seles Engineer

Suitable applicants should telaphone (reversing charges):

Hemal Hampsteed 81288 and ask for Mick or you can write to him at the following address:

E Computer Machinery Company Mexico Close, Hernet Hempelead: Herifordshire H.Z. Telephone, 0442 81286 Talex \$25629 Cables Compute Hands

Consultancy/ Software House Wimbledon up to £9K plus

Our client, the Cross Computer Group Lot, is a long established, growing Concultancy and Software house, providing services to a number of Reinstrance Companies. Insurance Companies. Commercial and Government Organisations both in the cranity and overseas. The work is largely to the own-based at our officer very close to Wimbletton main line and underground station but occasional visits to elient sites may be required.

They are still small enough to offer a triendly personal but somal working environment and dedicated to providing the astfole service to their clients

The Circup has its own in house Computer Sestem, offering interactive development facilities, through VIsU screens, in a fertual stronge environment, on modern sophisticated equipment There my a write variety of permanent positions available and salastes reflect the importance placed upon the need to employ conscientious people with ability and responsibility

Salaties start from around E.1 5000 per appropriate tunion dail to an eathing potential in excess of ED HILL

Technical Concultants

The requirement here is for experienced senior analysis with personality and ability to communicate. They will take on a personality and ability to communicate. They will take on a customet flass of rule, perhaps even a falle marketing, but have the technical ability to follow projects through to completion in a project management capacity. It is likely that such puople will be older than \$7 years, with a degree, or equivalent, and some \$8 years + experience in data processing.

The Croup is developing a major on time package for the tentaurance industry and need good analysis (or various levels) with on this and financial systems experience. Finiteral commen analysis are also registed for work to other areas

Analyst/Progrommers and Progremmers

The abovementamed on line package is written in COBOL (ANS). We require several Programmers for this and other projects, a not appoint of 2 years COBOL and for RPGII would be required.

Contract Staff

The following represent a selection of our crurent assignments in to about from Bertlandshire to Bergooda OPTO TELECULAR REAL BOOK

Real-time On Line scientific Medical application Marto Assemble Januarie on Minchine Inmediate

Univac 1110 (*OBO) to Cellstill, conversion atabase exp. preferred

PL TCICS immediate start in TOP RATES Biussels Frankfurs RPG from System 30,429 Sprogrammer analysis required for January start

(humediale start) *Datapoint 5500 (Databus) end November

Competent COBOL programmer — knowledge of Sestem 3 escential 1 month to work in Condensity code and study job Describer in Bermuda to implement the birdy complex system for remisorance Chem.

Series J.P. L'Assembler New Year
 ATO 1994. — TP of TASKMASTER preferred

2 people who speak Prench required has 2 years

Beillordshire Senior apaiss as prognammers (BM environmen required manifolding)

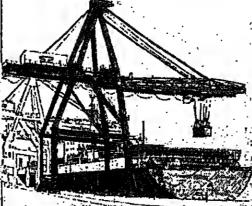




Meteor Computer Consultants Ltd.

Barry House 20 22 Wordle Road Wimbledon

Systems Manager \cup p to £7,364 including London Allowance



The British Transport Ducks Board Computer Centre at Southall, Middlesex which provides compiler services for III ports and other Port Industry organisations, requires a Systems Manager, responsible for udvising the Board's management on the use of computers and for managing oll aspects of the development work undertaken by a team of up to eight systems and programming staff working on a variety of projects. Applicants, after a vivinen, should ideally passess a degree or relevant professional applications and have several years, project intimagement. qualification and have several years' project intamigentent experience of commercial applications. Applicants are invited to confact 1 in Beyer, Deputy Head of Computer Services on the 573 fill is or write to the British Transport Pocks Board, Computer Centre, Hoyes Road, Southall,



Systems Analysts: Trainee Systems Analyst

YORK

Our menagement eervicee department at our Group Heedquertera in

SYSTEMS ANALYSTS . . . with between one and three yeers' experience, to work on a wide range of new eveterns developments

Distribution, Sales, Production, Purchasing, Export and Enginearing are just e few of the ereas in which we are currently daysloping systems. Your particular experience need not be in any of these, as we will provide training according to individual needs. We are looking for the investigative, personal and technical skills nacassary to carry a project through from an ambryonic idea to a functional system. If this can be backed up by imagination, ealf reliance end en inclination to tackla demanding and challanging problems, it would be ideel.

The equipment we are currently using includes the IBM 370/148 and IBM 370/158 computers with off-line and on-line terminals. Our main programming language le PL1 end our operating system is VS1 with VM/CMS in usa for the interactive development of programs. During the first half of 1979, an IBM 3032 will raplace the 148 and MVS will raplace VS1.

TRAINEE SYSTEMS ANALYST . . . to work within a systems developmant team. We are also interested in applicants who have recently graduated; or those with et least two years' progremming or systems re-

Starting salarias will be competitive and will reflect current market rates. In addition, there are good prospecte for promotion within management earvices end into other areas of the compeny.

If you are interested in either of these posts, please write for en application form, quoting ref. FY/604, to Mies D.M.N. Dick, Staff Office, Rowntrea Mackintoeh Ltd., York YO1 1XY.



GP Rowntree Mackintosh 🗞



IBM 370 & PDP-11

Analysts - Designers -**Programmers**

£6,000 — 10,000 p.a. London + EEC

INFORMATICS INC. can offer genuine ground-floor appointments to Programmers, Analysts and Designers who have specific experience of any of the following:COBOL.PL/1. Assembler, MKTV, CORAL 66 basic, RTL II on IBM, PDP-11 or other mini systems. If you have either potential or proven experience in IMS or CICS on IBM 370 under O.S. or Message Switching and other real-time communications expertise on Minis we would like to meet you. At informatics you will certainly be encouraged to develop creative skills and to contribute your ideas within an innovative environment coupled with significant autonomy. You will also be called upon to shoulder more responsibility than you have in the past. You will also be given every opportunity to extend your skills and horizons Through our enlightened policy of training and orientation programmuss.

To those who enjoy travel we ofter positions in Holland. U.S. offices for 18 months.

highest salaries in the industry and will of course also. meet all your re-location expenses. All positions are open to both men and women who can dernonstrate stability and potential and with genuine desire to join a prestige International consulfing company

send your curriculum vitae to anabae an immediate. interview in London.

informatics inc

Africa House 64-78 Kingsway London WC2B 6AL 01-405-8546

The value of

keting department.

HERTS NORTH LONDON

We specialise in D.P. recruitment in the Herts/N. London area and the following vacancies are a selection from our current register.

ENFIELD WATFORD Analyst/Prog. Cobol c. £5500

EDGWARE

Sen. COBOL progs. any machine, cf 6000 Anal/Prog. to £5500

WEMBLEY

PL/I Progs., to £6500

WALTHAM CROSS

COBOL progs, any machine, to £5500

ST. ALBANS

Anal/Prog. £5800 or graduate Trainee, £3300

WELWYN

S.A. IBM background, to £ 7000 COBOL progs, to £5400

Syst/Prog. to £6000

POTTERS BAR

Prog or Prog/Anal, any machine to £5500

TOTTENHAM

IBM 370 Operator £4200+ Sen. R.P.G.II Prog. to £5700

HODDESOON

S.S.A. 3 years exp. to £6500 S.A. 2 years exp. to £5900

STANMORE S.A. £6500+

BOREHAM WOOD IBM Cobol or Ass Prog. 1 year +. To £4500

CHESHUNT

IBM·S.A. to £6500 IBM COBOL Progs to £5800

ENFIELD

PL/1 Progs to £6300 PL/1 Team Leader to £7000

For more information ring:

HAYMARKET COMPUTING LTD

Tal: Cuffley (Harts) 4130 up to 6.30 p.m.



So you think you know RPG II

If you know it well enough in find foulls in the system softwore, than we MANA AKA KI TOLK LI YOLI

The person we need ahould have: About 3 years experience in RPG II programming

6 A knowledge of the RPG compiler and run time controller

Some assambler language experience liteally experience of acri and merge programma usage * An engineering mind capable of writing and enhancing test software with minimal supervision.

* The chance to enter the expanding adence of softwere lesting * Excellent career development progress.

Stimuloting environment

₭ Gnod company.

Data 100 nre the world's leading supplier of computer farming equipment und continues to expand.

For further defails contact Gooff Hicks, Data 100 Ltd., Moxied Close. Humel Henrinstead, Harts 112 7EG. Telephone: Homel Hompstand 61281.



Computer Operators



Come and join our team at I eavesden where we are currently operating an IBM 370/135 installation but shall be upgrading within the next few weeks to an IBM 37tt/138 (1 Mb) operating under DOS/VS with PDWER/VS and CICS/VS. If you have one year's IBM-DOS experience you could be just the person we are looking for. Contact us Inday! We will offer you an attractive commencing salary plus all the usual benefits of working for a major Company. There is also the superb Rolls-Royce Sports and Social Club,

For further information or an application form please contact PETER BANTON, SENIOR RECRUITMENT OFFICER, ROLLS-ROYCE LIMITED-AERO DIVISION, LEAVESDEN, WATFORD, WD2 7BZ, or telephone GARSTON 70935.

These positions are open to both male and tentale applicants



[DATABASE

SENIOR DATABASE

ADMINISTRATORS & DESIGNERS-LONGON & EUROPE

The U.K. and European divisions of U.S. public Corporation have openings in their London & Zurici offices for Benda Octobese Administratory. Ostopera and Applications personnel wish esteroly

tions parsonnel wish estimates between experience using any of the proprietary DRMS currently in use on major maint-frame and mini systems. Of particular interest are passents with expertise in IMS, TOTAL, AOABAS, OMS, IOMS etc., Herdware backgrounds ate of little importance — what he seemfel is importance — what he seemfel is importance are of Detabase aspertise. Our client is analous to mointeln it's prestigious atending world-wide by extracting proven and potential telent to join them in the development of suvarious Outglease projects in commercial and teological antivorments.

Telephone:01-4914636(10 Lines) 360 Oxford R. London WIN 981A.

OXFORO UNIVERSITY COMPUTING SERVICE

SHIFT LEADER

The Service provides computing lecilities for the University based upon 2880 and 1906A central

ni-ended by 7808, 7803 and

Mod 1 computers. Grephics eul-put and microfiche are also pro-vided. The Shift Leader is res-

onsible for running one main amo and its sesociated equip

Candidates for the past should have at least two years' experience of GEORGE 3, or at least one years' experience of VME/8

Solary scala \$3,060-£4,104 per

policotion lorms and feither latella may be obtained from

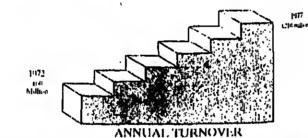
Miss J. C. Luste
Oxford University Computing
Service
13 Sanbury Road
Oxford OX2 Sanh

ephone Oxford 56721.

ennum plus shift allowence 5647 (3 shift) or £488 (2 shift).

AERO DIVISION

Senior & Junior Systems Analysts



NEXDORF COMPITER has been involved in electronic data processing since the early days of accounting machines and visual record computers. This mittal expension has given us a greater understanding of management needs than most other supplies when a comes to producing computers for the effective control of all aspects of modest business. GIL(8)[1] NIXIXORF installations says that has robe a fact.

We produce superbly reliable computer hardware. If you look inside any of our cony you will be immediately impressed by the Thatonic Ellictoney of it's design and constraint. IF THE 8870 DISK DASED SYSTEM IS THE MERCEDES OF BUSINESS COMPUTED. THE 8820 IS THE DAIW! We believe in providing our elients with total computer systems rather than supplied

hardware and passing the 'sufeware linek' elsewhere. For this reason we have our own comprehensive portfolio of program packages covering stell applications as:-PRODUCTION CONTROL: Inventory Management and Purchase Control, Bill of Management and Purchase Control of Mana COMMERCIAL ACCOUNTING: Invoicing, Sales, Purchase and Nominal Ledgers, Commercial VAT Assessment Control, VAT Accounting, Payroll.

Fast growing demand for our new 'state-of-the-art' disk-based business complete.

Sales Support Analysts

To work a losely with sales people in the preparation and presentation of p management, installation of computer systems and the production and design of parties programs.

Applicants should have a minimum of 2 years' programming experience programming COBOL or BASIC, concerned with at least three of the above application areas

Senior Support Analysts

Should have at least 2 years' additional analytical experience or involvement in

instellation of package software within commercial or industrial accountly Junior Support Analysts of Some opportunities are upon to applicants with formal accountancy qualifications of

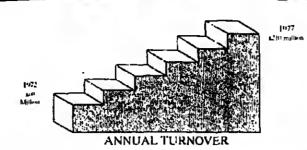
experience of interactive programming. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. These job opportunities will provide on income range of £6,000 £8,100 p. 8. The first provide of £6,000 £8,100 p. 8. The first provide on income range of £6,000 p. 8. The first provide

Please apply in Owen Cooper, Nixdurf Computer Ltd., Hounslow Cells, Lampion Read, Hounslow, Middlesox, TW3 IJB. Telephone, 01-57-311



NIXEE WITH COMPLETE

Sales Executives



NIXDORF COMPUTER has been involved in electronic data pricessing since the early days of accounting machines and visual record cumputers. This initial experience has given us a greater understanding of management needs than most other suppliers when is comes to producing computers for the effective control of all aspects of modern business. 60,000 NIX DORF installations says that has to be a fact.

We produce say orbly rehable comparer bardware. If you hold inside any of our comparers you will be immediately impressed by the Tentonic Ellis iercy of it's design and constitution. IF THE 8870 DISK BASED SYSTEM IS THE MERCEPPES OF HUSINESS COMPUTERS

We believe in providing our clients with total computer systems rather than supplying the hanlean and passing the 'software buck' elsewhere. For this reason we have our own comprehensive portfolio of program packages covering such applications as:-

PRODUCTION CONTROL: Incentory Management and Purchase Control, Bill of Marchals Pocessing, Materials Requirements Planning, Production Scheduling and Losting, FOMMERCIAL ACCOUNTING: Involving, Sales, Purchase and Nominal Ledgers, Credit formal, VAT Accounting, Payrott.

East growing demand for our new "stage-of-the-art" disk-based business computers has

Senior Sales Executives

With a least 2 years' successful sales experience of small business computers, data piccessing equipment, computer bureau services, or peripheral equipment, related to comment ad applications.

Sales Executives

Withouterord of society in selling office products a letical systems or business forms will and this a good opportunity to move must be booming market of computers The sale superation is by keel by a high level of rechnical support and comparisons of its and positive training is provided. A generous income package is available in holing a high bow value, commission and large company benefits. Our successful sales executives even ally

£13,000 per annum

An initial guarantee against commission earnings is negotiable. Joh opportunities are available in: - London Branches, Birmingham and Manchester, Please apply to Dwert flooper, Nixdorf Computer Ltd., Hounshow Centre, tLampion Road, Hounslow, Middlesex, TW3 1JB, Telephone: 01-572 3111.

NIXDORF COMPUTER

TEXT PROCESSING PDP 11/34

Project Leader c. £6,600 Senior Analyst/Programmer c. £5,800 Analyst/Programmer o. £5,000

ngman Group, leeding educellonel publishers ere ambarking on an exclling renga of projects in the Dictionery and Reference Book area and require a Project Leader, e Senior Anelyst/Progremmer and Iwo Analyst/Programmers to help devalop the associated compuler systems.

A programming beckground is essential for these positions and pravious expanience of text handling systems end/or basic plus end RSTS/E are dasireble. Experience of information retriavel would be a lurihar advantage. Emphasis will be placed on individual responsibility working within a learn anvironment and on close user

The positions will be based at the company's head office in Heriow, on tha Harts/Essax border. Working conditions are excellent end e wids ranga of company banelits is avellable, including generous ralocalion expanses.

For lurther information please telephone Stella Etheringion on Herlow (0279) 26721, extension 29, or write to her at: Longman Group Limited, Longman House, Burni Mul

。 《大學學》和中華語為

Harlow, Essax, CM20 2JE

Longman

BICC GENERAL CABLES LIMITED **LEIGH WORKS**

Applications are invited for the following positions.

SYSTEMS ANALYST

Applicants should have a sound knowledge of commercial routines, e.g. stock control, order processing, etc. and have a background of O.S. Mior similar discipline. A knowledge of rogramming would also be advantageous

The successful candidate, male or female, would be expected to take responsibility for an erea of compute application, e.g., accounting, commercial, production, etc. and will be required to develop now and existing systems as equired. The job will involve some travelling to various sites broughout the Company and a current driving licence

SENIOR PROGRAMMER

Applicents, mele or lemale, should have at least two years' experience of ICL COBOL, a full working knowledge of the GEORGE III operating system, and experience of super-

The principal duties will consist of designing progret urries from system specifications and being responsible to esting, implementation and subsequent program main

affective commencing salary and conditions of employ-ment will be offered to the successful candidates. Applications in writing giving details of age, quelifica-tions, experience and present salery should be sent to:

Mr. P. Jockson Personnel Officer (Blaff) BICC General Cables Limited Vest Gridgewater Street

BICC

Portamouth Polytechnic Computing Centre

Applications Programmer

We have recently installed an ICL 2960 and an ICL 2094 to provide a computing service to the whole Polytichnic Applications programming projects cover not only scientific and technical work but also the dissign and implementation of computer systems for the administration and library. The Computing Centre seeks to rectual a programmer of graduate of equivalent qualifications, and some provious experience, who wishes to increase his above experience by working an incident computers. There is a wide range of projects flow being stated including graphics software, implementation of the IDMS database, and software, to support numbers briked to the

Salery Scale: AP214 up to a maximum of £4,632 including

Senior Computer Operator

The Polytechnic service is based on a large ICL 2960 supplemented by ICL 2904 and a professional operator is required to join a small operations group currently working on two shifts. Candidates must have a good understanding of VME/8 or an equivalent operating system, and at least three years' operating experience together with an 'A' level standard of aducation. Selary up to a maximum of E5, I 49 including shift allowance, overtime and supplement.

Applications are available from the Steff Office, Portsmouth Polytachnic, Alexandra House, Museum Road, Portsmouth, or by telaphoning Portsmouth 27661 exten-

Weish Health Technical Sarvious Organization Systems Analyst £4,421 - £5,326 p.a. (Scale 4)

Applications ere invited from sultable applicants for the post of Systams Analyst in the Organisation's Computer Dapartment. The successful applicant will be required to assist in the detailed design of a computer based information system. A previous knowledge of Systems Analysis

would be an edvantage.

Application form and job description obtainable from the Personnel Department, Weish Health Technical Services Organisation, Heron House, 35/43 Newport Road, Cardiff. CLOSING DATE: 29th November 1978.

COMPUTER DEPARTMENT COMPUTER DEPARTMENT
Welsh Health Technical Services Organisation
Swyddia Gwasanaethau Technegol Jeonyd Cymru



sales literature man knows how to use his specifically to a particular sales literature effectively, product, industry or busiand that he was able to ex- ness activity it is bound to pound his ideas at the time have greater conviction in the material was designed, the eyes of the client than

there is very little he can do amorphous "catch-all" about the efficiency of the brochures. brochure and leaflets that Sample outputs/reports are made available for his are always good value in sales literature, but only as Let us view the situation long as they are basic docu from the point of those re- ments rather than attempts sponsible for creating sales to show how clever the literature. In a small com-supplier is. A relevant

pany where sales and marketing responsibility probably resides within a single department, the job is likely to be the responsibility of the sales manager (or a rose by any other name!). In a tem operates.

lorger organisation it is A "benefits list" is an esrightly the lot of the mar-sential feature of any sales literature. After all, these The control of such are not only the reasons activity is certainly not the why the client is going to function of an internal or buy, but also confirmation external artwork or adver- of the platform from which tising resource. Their res- the salesman will attempt to ponsibility should be limited close the sale.

to aesthetics and possibly Some salesmen like to writing copy in the context tick or underline the most of presentation, not making relevant henefits just before fundamental decisions on handing over a leaflet or markets, benefits, pricing, brochure; I don't object to reference clients, relevant Thut.

applications and so on.

So what are the considermuch about what is good or ations the marketing de- bad in the context of artpartment needs to make?' work. The whole topic is Certainly there are many, highly subjective. However, and I can only hope to touch one thing is certain: the on those which I feel are function of artwork within sales literature is to comp-If we accept that the lement and enhance and primary function of sales wherever possible emphas-

sales story which has already been told, then it is easedling point.

It seems to me this is already been told, then it is where most of file really essential that its continuity disastrous errors of judgis compatible with both the ment occur - the use of too sales argument being pre- many colours, selfsented in the field and the indulgent design, bizurre sequence in which it is perphotography, and so on, typically geared to the There may sometimes be eccentricity of the artist rather than the needs of

reasons why it is necessary to change the sales presentailon to fit new literature, but whichever way modifi-cations are mode the sales One particular point about photogrophs: they must be relevant. Pictures of buildings and larries, for monager must be involved from the outsel; and for a Instance, are of interest only variety of other reasons too. to the building and trans-Another point about con-tinuity is the fluency of the dialogue and the overall control for the pharlay-out of the dealgn. It maceutical industry then let must be eeay to read as well us see the main warehouse as providing a reason for reading on to the very end.

Bearing in mind this close relationable between literation down-town Chicago.

The copy itself needs to absolutely succinct and

basic structure of the sales positive getting quickly to call. Seek the client a pro-blem, identify the solution the reasons why the poten-tiel client should buy the and agree reasons for products offered by the lesman. Too many sales Sales literature should documents wax eloquently; enhance the professional almost lyrically, about a credibility of the supplier by promoting the industries the atote of the economy to and applications where extended the supplier's sports and perience and succeas is social club without making already established (using the point. Even if the major 'reference sells' where sales adventages are made, possible) by describing the they are buried too far beproduct and Ita range of neath a plethors of verbiage uses, and highlighting the ever to see the light of day; benefits and unique advan- One final point which

benefits and unique advantages the company and product have to offer.

The process of deciding to buy and making a choice can create considerable insecurity for the buyer. If sales literature does not give an impression of keing departments on your reliability and professionals list the buyer will feel less secure and therefore less likely to choose the product.

concerned.
Specialisation is so much more powerful than generalisation in all aspects of sales and marketing and

Puzzle Answer

this is particularly true of THE largest product results sales literature it such from 9.42 times 87.581



Communicate with Racal

Enquiry Systems Limited is the newest Company within the international Rapat Electronics Group The Company develops and markets message communications and televiruan additional systems using microprocessor lechnology. Opportunities now teast in the following areas:

Design and Development Engineers

- to be involved from conception to production in the design of special products in the message switching field

Applicants should hold Degree. HNC qualifications and have experience in digital electronics. microprocessor lirmware or communications

- to join a small but highly-motivated team developing software for a microprocessor based communications controller

Applicants should have five years experience in one or more of the following real time system: programming, basic software development, system design, hardware, software interfacing

Applications Programmer

- to be actively involved with the software development team with the opportunity to move into

Applicants should be experienced assembler programmers who have been involved in the successful implementation of at least one major system. The ability to program in real time at a

All positions carry attractive salaries and benefits and will be based in High Wycombel Bucks. Relocation assistance will be available where appropriate

Write with details of age, qualifications and experience to

Personnel Officer, Enquiry Systems Ltd. Hafifax House. Coronation Road. High Wycombe. Buicks.

All positions are open to both male and fernale



terminal systems for many years.

products of their kind currently evailable.

CUSTOMER SERVICE ENGINEERS

An excellent remuneration packaga includes a new estata car.

DO YOU WANT YOUR CAREER TO TAKE OFF

WITH A COMPANY THAT IS GOING PLACES?

DELTA DATA SYSTEMS LIMITED have been installing aophiaticated video diaplay

To compliment our existing range of programmable ferminals we are introducing a new series of super-intelligent video display units. They are probably the most versalle

Our policy is to provide one hundred per cent support to our ever increasing user base, and to do this we need to employ more high calibre people who want their careers to grow quickly with an expending company.

We need highly motivated Customer Service Engineers with aignificant experience on state of the ert products, preferably edvenced microprocessor based equipment.

Since you will be working lengaly on your own initiative, it is important that you REALLY CARE about the standard of service you give to our damanding users.

TECHNICAL SUPPORT PROGRAMMERS
Ideally, you should have a good ecadamic background and at legat two years of experience in progremming micro or mini computer systems at assembly language level.

You will be joining a young and anthusiastic team and will be working in close liaison with colleaguas and customers. It is therefore assential that you are imaginetive and flaxible in outlook and have good varbel and written communications skills. We expect you to progress quickly and to assume project management responsibilities in the near future.

Your initial remunaration will depend upon experience and the excellent package we are offering will include a company car training.

All eppointments are based at our European Headquarters in Walwyn Gardan City end there may occasionally be opportunities for short duration visits oversees.

Opportunities

in Hardware

and Software

PERKIN-ELMER DATA SYSTEMS

Compiler

Salaries up to £7500

We provide all the usual lorge company banatits, including relocation expenses where appropriate, punsion and heelth insur-

For further dotails, telophono or write in Lon Barluw at:

Development

PERKIN-ELMER DATA SYSTEMS has further vacancies for programmers to work in Compiler Development in our Basic Software Department. We are lnoking for staff with a good background in Assembler-Level programming, and some Compiler experience in Development or Tochnical Support role. A working knowledge of one or more high-level languages is required, and we will be particularly interested in COBOL expertise.

We ere located between Shuigh and Burnham in Berkshire, with excellent motorwny and rail links to Landan and the West Country.

PERKIN-ELMER DATA SYSTEMS 227 BATH ROAD SLOUGH, BERKS. TEL: SLOUGH 34511 ext 95

Write to, or cell. George isaacs DELTA DATA SYSTEMS LIMITED

Data Systems Ltd vellowfields Welwyn Gardan City Herts AL7 1JO Telephone: W.G. 33833

COBOL **PROGRAMMER**

Sterling Cable Company Limited, part of an international group, era one of Europa's foramost designers and manufacturars of industriel electrical cables. Our works and offices ere located in rural surroundings on the A4, nine miles from Reading and Nawbury.

We wish to recruit a Cobol Programmer to join e new taam developing Setch and On-line systems for commercial and manufacturing applications. Conliguration ICL 2904-40K, MTS, EDS 30s, FEDS and VIDEDS. Applications are invited from parsons of either sax up to the age of 3D years. Expariance requirements — one to two years' CDBOL programming. On-line

experience an advantage.

An attractive salary will be offered and banefils include 4 weeks' annual holidaye and a pension schema. Subadised centeen lacilities are available if

For an application form, please talephone our Parsonnel Manager; Mr. J. W. Heading, on Woolhampton 3221, or write to him at Starling Cabla Company Limited, Bath Road, Aldermaston, Reeding RG7 500.

To be the PANALOW



SYSTEMS ANALYSTS will have an interest in our new machine.

At ELECTROLUX, we know that no on-going capitol investment programme and a winning product ronge go hand in hand. You'll ece that by entering any one of the streamlined production areas where our superb domestic appliances take shope.

The next step is the replacement of our ICL 1904S with a new machine to cope with the ever inoreasing demands on our DP instullution which also provides services for several associated companies

We therefore need Systems Analysts to work on interesting new systems ond software projects. like the development of on-line systems, as well as a wide range of established commercial and financial opplications.

You should have at least three years' experience in systems analysis including a positive confributed design and implementation of a substantial project in an environment similar to ours. Electrolux can offer very attractive sterting saleries and many other lenge company benefits including generous staff discounts on company and associated company products and relocation assistance, when appropriate.

Male and female applicants should contact lan Molernon, Electrolix Limited, Liston, Beds.

Telephone: Liston 53255.



Block 21 (A Stumbling Block)
Disorientoled by Simulo's surprise Telecontinunication, Hex has done a burth, leaving his friends in Sprocket's Hole. He is making for Fort Ranfaut vin Silicon Valley. There he pauses near his her's grave to ruminate on the benefits of forgetting. LULED by his hymn to forgetfulness, it had almost slipped

Hex's memory that he was in hostile territory. He remembered suddenly when a shrill voice piped up right Behold! It is as it was foretold!"

Hex almost leept out of his shoes. Not two metres away was a diminitive elf-like personage of indeterminate age. He was rotund in shape with wispy orange hair and a small pointed beard.

"Welcome O Son of Synapse," intoned the strange little man. "I am the humble gontherd, Johnny McNull. I wish to become one of thy disciples, even though I am unworthy to

reboot thy bootstraps."

Hex stood transfixed. At first he had taken the stranger to be an ondrold like himself, for he was bedeeked with pieces of electronics. Quartz crystals, calculators, modulators, de-modulators and assorted chips hung from his citching like jewellery. On second thoughts he decided that all this was mere adornment. MeNull was probably a human who had failed the cybernation course but collected

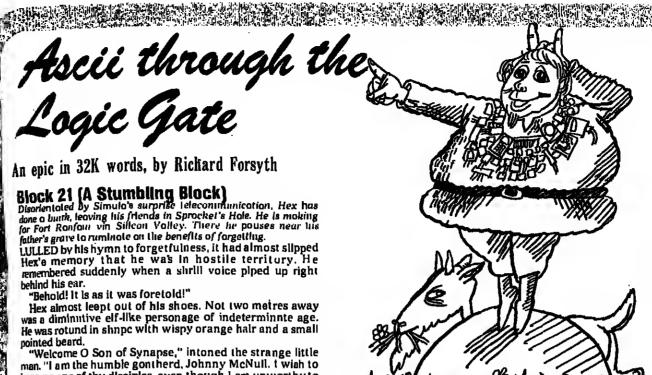
electronic curios like a jackdaw.
"I hove no disciples," he asserted. He could see at a glanee that the man was mad, but he didn't seem dangerous.

McNull began a reverential monologue. "Was it not prophesied in the sacred scroll-mode texts that there would be wailing and gnashing of teeth among the people, and that they would groan exceedingly under the yoke of the Children of the Brain? Verily, it has come to pass. And was It not also fore-ordained in the earliest records that there should be revealed, even unto a luwly goatherd in the Valley of Sand, a goat with sixteen fingers to be a sign that the end of the System was at hand? Now mine eyes have seen that it is so."

"Sixteen fingers," replied Hex guardedly, "I only have

"Thou art blind to the signification of thine own name. Art thou not the Kld that is called Hexadecimal?"

"fhen understand that than nel indeed the goal of



prophecy and that the sixteen fingers are the sixteen digits of the hexadecimal seale — including of course zero, which

Hex snw now that this madness was dangerous after all. He backed away.

"Lend us, O Master Program, we besetch thee, out of the Domain of Negative Irrationals through the Ordered Field into the Promised Range. For truly thou ort the Transformation Function."

"There is no Promised Ronge."
MeNull looked crestfallen, Hex pressed home his ndvantage with an oratorical flourish: "Verily I say unto you, the Promised Range is the Empty Set. It is a figment of your

McNull's eyes shane once aguin. He knelt down. "Such ineffable wisdum," he murmured reverently, "an imaginary

At this point Flex bolted. He just kept running—out of the reservation and heyond, north towards San Juse. When he 'finally eased up, he was sure he had left his would be disciple adrift for behind. The sun was sinking, but he decided to press on. There was no time to lose if he meant to beat Ascil lo Fnrt Ranfour.

He rounded a corner and stopped dead in his tracks. A

motorcycle was parked across the narrow way. On it,holding a terminator in either hand, was the ubiquitous

"I've been doing some research," were his opening

Hex was speechlese.
"There's a lot of information about you in the Database, if you know where to look. Apply a little common sense to it and your movements become rather predictable. I'm no APL guns, but I managed to knock up a few one-liners in an afternoon which gave your estimated time of arrival to the nearest minute — while the committee of savants up in Fort Ranfour is still haggling over data declarations."

"Good work," bluffed Hex. "I'm glad your disenchantment with brute computing power has brought you over to our side. We need beings of your calibre." He was playing

"Ha, that's good!" replied Hock. "I'm not averse to flattery, but you'll have to raise the atakes a tittle to save your skin. There's a reward of 10 million Resource Units on your head, I could do an awful lot of text processing with those." He spun his firearms casually like a cowboy in a

Suddenly McNull clattered into view, riding a sledge drawn by four goats. It was plied high with tubs of goat's cheese, milk and other delicacles, and had the words "McNull's Farm-Fresb Dairy Products" emblezoned on the side. Before Hock could react, he began pelting him

with ripe yogurt.
Hex selzed his chance. He grabbed Hock's crash-helmet and wrenched it the wrong way round. Hock lashed out blindly. A wild flash of radiation from his terminator struck the fuel tank on his machine and ignited the petrol. As he staggered back from the heat, Hex and McNull pinned him to the ground and disarmed him.

'Thanks," said Hex. "I guess I could use a diacipic after

"All part of the service," replied McNull blandly.
"Hey? What happened to the biblical Idlom? I was getting

"You meen the speech Impediment, I got that through trying to follow the instructions in Do-It-Yourself Cybernation Magazine. All voltage levels on the neural interfoce are meant to be +5 or earth; but mine weren't. I burnt out o chunk of my nervous system, I'm afraid. Ever since, when

the feeling comes over me, I talk that way. I can't help it. You'll find I have other endcaring quirks too."
"Whot about the Promised Range and oil that?"

"Just as you say; it doesn't exist.
"Too bod," said Hex, regretfully.

They handcuffed Hock with his own cyclc-clips and set of for San Jose on McNull's ramshackle chariot, leaving the bounty-hunter strunded in their wake.

Do you know the way to San Jose? It's going to be a

12 1978 Richard Forsyth, Bull Timesharto

BOROUGH TREASURER'S

The Council's present computer installation, a Honeywell 125 0isk and Magnotic Tapes, is to be replaced in mid-1979 with Honeywell Level 64/20 Disks and Magnotic Tapes in conjunction therewith the Council propose to expand their present team of Systems Analysis and Programmers

SYSTEMS AND PROGRAMMING MANAGER - POST T90/2 GRADE P01 (3-7) (£6060-£6702 per annum

This is a new post. The parson appointed will supervise that Systems Analysis and Programming teem and to responsible for the dissign, specification, testing and mointenance of both on-line and betch systems. The ability to haise with user stall at all levals to assential. Applicants should also have at least 5 years experience at senior management toval in developing computer applications.

COMPUTER PROGRAMMER — POST

GRADE AP 3/4 (£3732-£4632)

Work includes development of new applications of both on-line and batch systams, and maintanance of axisting programs. Applicants must have at least 2 years relevant experience and be compatent in the use of COBOL. The commencing salary will be determined having ragerd to experience. 100% removat expenses. Up to £500 payable lowards legal and eaters agant's lease plus generous disturbance and separation allowances. Flaxible working hours.

Tamporary housing eccommodation may also be availabla. For application forms and further details writs to the Personnal and Management Services Officer, Box No. 16, Fareham Borough Council, Civic Way, Fareham, Hants. P016 7PP. (Tsi. Fareham 236100 Ext. 232.)

Closing data for recalpt of applications 5th Decamber, 1978. **Fareham** Borough Council

IBM 370/ 135 Ops.

EDUCATION DEPARTMENT RICHMOND UPON THAMES COLLEGE

Part-time (Day) Lecturer in Computer Studies

Required immediately for up to house per week Places telephone / R. Sheady, Q1.882 0858, au. 1 Richnood upon Themes College, So lon Road, [wicksnipp TW2 75.]

job set-up controller

We are looking for a Job Set-Up Controller to be responsible for supervising a team of Job Assemblers in praparing schedules and assembling johs for the Operations Denartment.

installation centrad round a one mogabyte (words) quailruple H66/8D, with extensive online and betch applications, Substantiel Hardwere enhancements are pinnincd for the near future. The ideal candidate will be an experienced

This company is a major user, with en

operations specialist agad 23 - 30 who poasessas a broad knowledge of operating systems (with particular reference to JCL) and significant practical experience as a Shift Laader or Job Assembler.

We can offer an excellent salery, good working conditions and first-rate prospacts in a rapidlygrowing Installation. If interested, please write with brief details of age, experience and education, to :- Alan Picton, (Ref.92/1611/CW); Appointments Manager, Littlewoods, JM Centre, Old Hall Street, Liverpool X L70 1AB.

Littlewoods

TALAR

TOURIST AIRLINES OF PAPUA NEW GUINEA

AN EXPERIENCED ICL RPG2 PROGRAMMER (COBOL helpful)

WE HAVE ICL 2903 With EDS60

YOU GET Exceptionelly good peckage for the right person.

terviews held in London week commencing 19th

Apply with full details to Mr. Goold Box No. 1998

Senior Programmer Gloucestershire

Renk Xerox Manufacturing Group Investigational U.K. Jacroty located at Mitcheldean in Gloucestershire. Here in attractive rural surroundings an extensive modern site emphoya over 3500 people on the Design, Manufacture and Distribution of some of the company's most advanced business machines

We have an opportunity for a Sanior Programmer to join a team committed to a wide singe of systems (based on an IBM 370) in a challenging and atimulating environment where there are excellent prospects for career devalopment. The euccessful candidate will be a majure professional with a minimum of 4 years

IBM COBOL, including 2 years under OS and experience of large main frame systems using date base techniques. A good knowledge of UNIPAY and linancial applications and a knowledge of Assembler will be additional advantages The auccessful carididate will be offered an attractive salary, excellent conditions of

employment including pension schame, frae life assurance and (where appropriato)

Apply giving datalls of your qualifications, career to data and current salary to Mr. N. C. Abraham, Parsonnal Ospartment, Rank Xarox Ltd., Mitchaldean Gloucestarshira.

RANK XEROX

MANUFACTURING GROUP

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday.

Ring lan Carter for further details on 01-261